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RAIL-ROAD NEWS.

Georgia Railroad.

Something less than twenty years ago, says the Columbus (Miss.) Republican, Geo. B. Clayton introduced into the Legislature of Georgia, the first bill for a railroad charter in that State—the Georgia Railroad. The State is now reticulated with these great channels of commerce and travel. As a consequence, every species of mechanical and productive industry has been vastly stimulated, giving to that sister State a progress and prosperity that renders her the pride of the South and the rival of the North in all that signalizes a great, growing, and enterprizing State. This illustrates the rapid success and magical effects which mark the spirit of railroad enterprise when fairly aroused and practically experienced. These are great truths. Senator Gwin, from California asks Congress to construct a railroad to the Pacific; this enterprise must be consummated at no remote period; it is time that something tangible was done to carry out the project. The State of Missouri has jumped into the traces and shown a noble spirit.

Safety of Railroads.

The Vermont Legislature at its last session, passed an act, designed to protect the lives of travellers on railroads. It forbids the employment of conductors, engineers, brakemen, or switchmen, "who shall make use of intoxicating drinks as a beverage," and the employment of such a person, with the knowledge of the President, superintendent, or any of the directors, exposes the company to prosecution, and a fine of $300 to $3,000, besides being liable for all damages that may result. The same act contains a stringent provision against one train running upon the time of another.

The Philadelphia and Pittsburg Railroads.

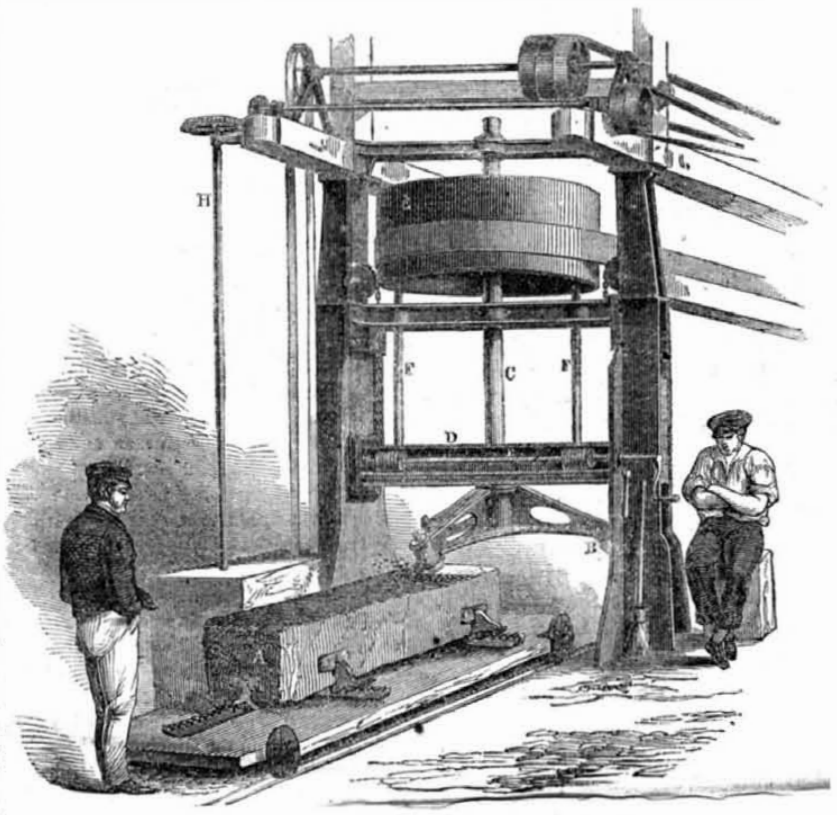
A line of Railroad from Philadelphia to Pittsburg is nearly completed; as it is, passengers can reach Pittsburg in twenty-four hours after leaving Philadelphia. What a change in reaching the country beyond the Alleghenies. It is but a few years since the winter's journey across those mountains was one of ordeal to travellers, now they can journey over and beyond the mountains as cosily as if they were sitting in their parlors. This is what science and mechanical invention has done for the world. Politicians talk, and talk, but do not move the world an inch; the engineer acts—he removes mountains and fills up valleys during the time some men are spouting in the Senate.

Air Line of Railroad to Boston.

This projected line between this city and Boston, is in a fair way to succeed. Upwards of a million of private stock has been taken, and several corporations on the line are pledged to liberal subscriptions. In Middletown, $1,054,300 has been subscribed. The new work will embrace about 96 miles from New Haven to a point near Blackstone, Massachusetts, to a connection with the Norfolk County Road. The friends of the undertaking are quite sanguine of success.

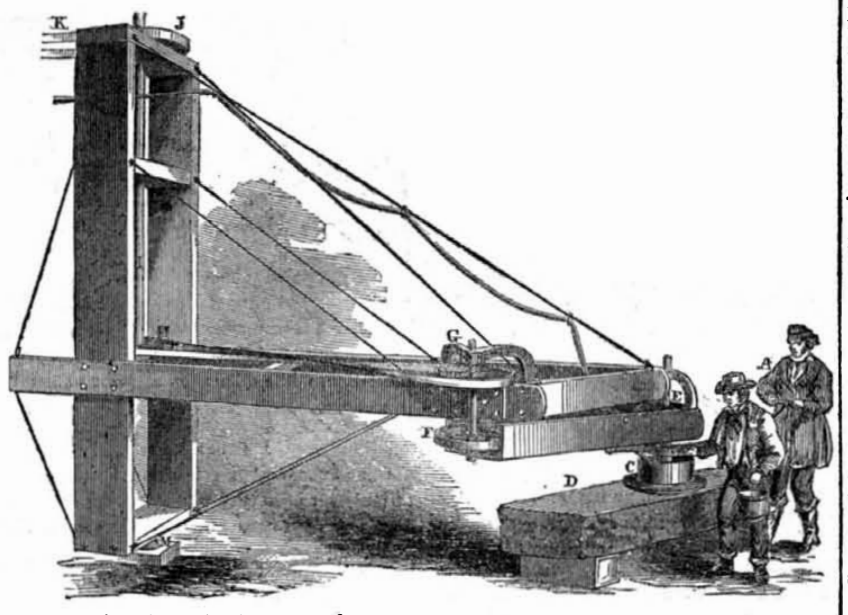
STONE DRESSING BY MACHINERY.---Fig. 1.

STONE CUTTER.



We here present engravings of two machines for Dressing Stone for buildings, &c. Fig. 1 is a perspective view of the Stone Cutting machine, and fig. 2 is a perspective view of the Stone Polisher. The Stone Cutter is known as "Wilson's Patented Machine." It is differently constructed from the one presented on page 284, Vol. 5 of the Scientific American, that one being a reciprocating machine, while this one is a rotary. The action of the cutters in both is the same; the mode of actuating them is different. A is the rough stone on its carriage moving forward to be acted on by the cutters, B B B; these are three quoit-shaped rolling cutters secured on the extremities of three arms, which are fixed on a boss secured to the shaft, C. G is the large pulley for driving, by a belt from the engine, the cutter shaft. D is a slide bar through which the shaft, C, passes, and in which it rotates; this slide is capable of moving up and down in guide grooves in the sides of the frame. E is a transverse spindle with section screws cut on it; these take into pinions (not seen) on the screw rods, F F. These screw rods work in nuts in the stationary transverse plate above, therefore, by turning the spindle, E, by the crank handle at the side, the cutter shaft and cutters, along with D, are moved up or down, as may be required. This is necessary, in order to set the cutters for stones of various thickness. The shaft, H, passes down and drives a pinion, which acts upon wheel on a transverse shaft working under the stone carriage-way, and moving the same to feed the stone backwards or forwards, as required. The operation is so simple that any person will be able to understand it at once.

FIG. 2.—STONE POLISHER.



This machine is as simple as the other. A strong frame consisting of two posts (and other appendages) is fixed on a strong short iron shaft at the bottom, working in a socket to allow the whole frame to be swung round. A number of stones are set in a circle, one of which, D, is now shown with the polisher, C, acting on it. The polisher is an iron disc which receives a rotary motion as follows: K is a belt from the engine, it drives a pulley, J, which has a vertical shaft in the frame, on the lower end of which is the pulley, H, from which a belt drives the pulley, G fixed on a small vertical shaft in the frame, on the lower end of which is a pulley, F, from which a belt drives the pulley, E, on the shaft of the polisher, C. The polisher is hung in a small frame, the inner end of which is on a pivot joint, which allows the attendant, A by his lever, which is attached to the polisher frame to raise it up and let it down at pleasure, for stones of various thickness, and also to turn round the whole frame. Owing to the manner in which the polisher is hung in the frame, its face always acts true on a plane, consequently the whole face of the stone is always polished correct. A hopper with sharp sand, having a small hole at its lower part, is placed in the polisher frame above the stone. A small stream of water through a tube from above, percolates through the sand, carrying a portion of it down on the stone, D. As the polisher is made of iron, the sand is the substance which smooths the surface of the stone. The rods in the engraving are merely the braces of the frame. This description will render the action of the machine clear to every person.

At the foot of 28th street, East River, this city, is the yard of "The Empire Stone Dressing Company," the extent of which, the number of machines and hands employed, constitute it the largest in the world. There are three polishing machines like fig. 2, five stone cutters like fig. 1, and there is one reciprocating machine like that described on the page referred to before. There are three hundred persons employed, mostly for trimming, squaring up, carving the stones, attending the machines, &c. The stone yard is like a hive of bees. The stones are landed on the yard dock direct from the vessels, and everything is conducted upon a large and apparently economical scale. The President of the Company is C. T. Shelton, Esq., Solicitor, No. 12 Wall street; the Secretary is George Sherman, Esq., and the able Manager of the Yard, and its multifarious concerns, is Mr. Wm. Chave.

There can be no question about the superior principle of Wilson's Stone Cutter. All Stone Cutters heretofore invented have failed to prove economical and satisfactory; but this one embraces every quality to work economically by power, and it produces beautiful work. This is owing to the peculiar action of the rolling cutters. Machines of this kind would answer well for small yards in villages, to work by horse power; they would effect an immense saving of severe mechanical toil, and would allow the stone-cutting artist to perform the more light, artistic, and agreeable labor. This machine can cut granite and marble as well as free stone, and we hope the time is not far distant when it will perform for the stone cutters what the planing machines have done for the carpenter; the severe toil of the "banker chisel" will soon be like that of the jack-plane on flooring—obsolete.

We have visited the yard of the company more than once, and it is a treat to witness the accuracy with which the machines operate. They are all driven by steam power.

The stone is cut down by the successive strokes of revolving cutters to a comparatively smooth surface, and the edges are left as true and unbroken as if done with a sculptor's chisel. By the subsequent application of the polishing machine, also worked by steam, the surface of the stone is reduced to a smoothness unsurpassed by the most labored work of hand.

Thus far the machines have only been used for the reduction of blocks of stone to plane surfaces. The ornamenting and irregular work is of course still done by hand.

The immense saving of labor by this method of dressing stone may be seen from the fact that an experienced workman, by his greatest unaided efforts, can only dress from 12 to 15 superficial feet per day, while one of these machines, attended by three men, will cut about 350 feet.

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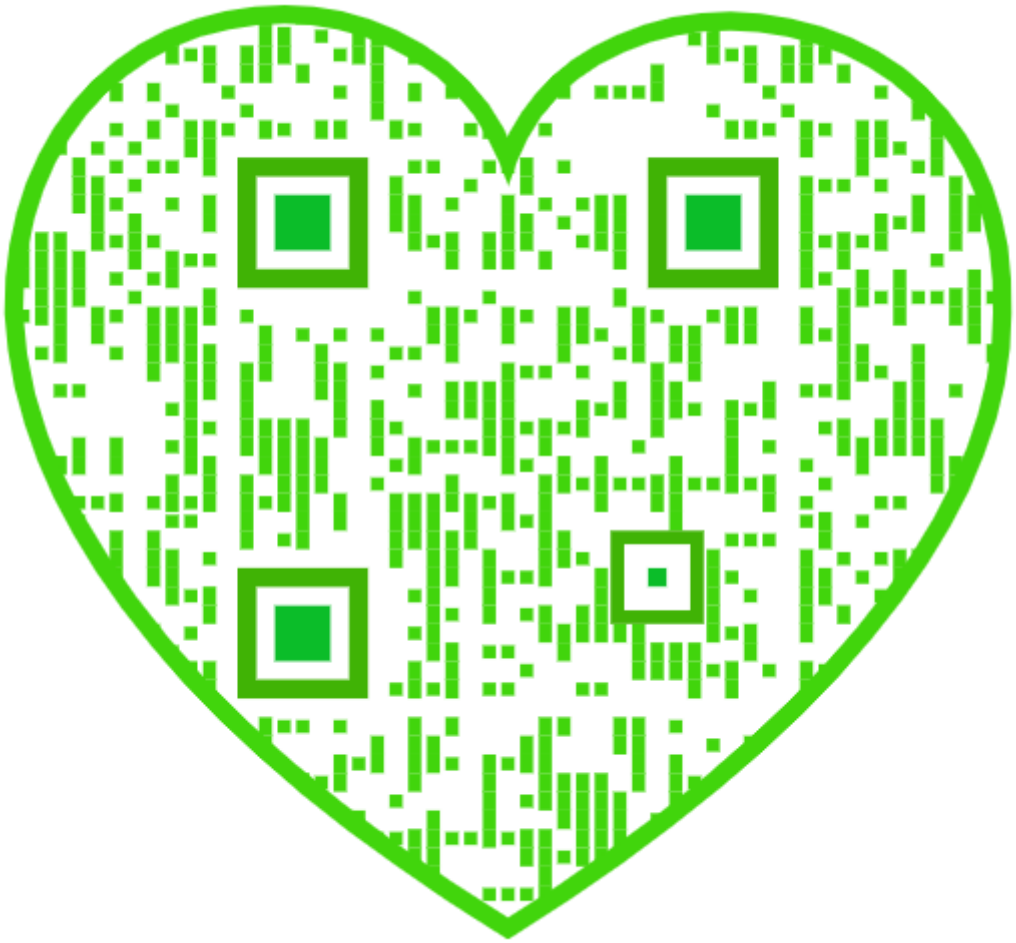

From the simplicity of their construction, the original cost of these machines is quite small and from certain peculiarities of arrangement, they are subject to but little wear and tear. The cutters are so adjusted that the friction necessarily attendant on them becomes a sharpening process, and the beds into which they are set are so firm and solid, that little injury arises from the motion of the machinery. A wonderful revolution must inevitably follow the introduction of these machines. The old method of dressing stone by the tedious process of hammer and chisel must yield before it, and stone cutting by hand, from being a mere laborious drudgery, is raised at once to the dignity of an art.

The use of dressed stone as a building material must be indefinitely increased, because the great obstacle to its universal employment, viz., its great cost, will be done away.

The demand for skillful hand labor in ornamental work must be proportionably increased, so that what seems at first to the operative to be an evil, is really calculated to open to him a wide and more desirable field of labor.

We commend this remarkable invention to the attention of capitalists, builders, and all interested in the growth and decoration of our city.

MISCELLANEOUS.

The Electric Telegraph in France.

It is well known that the Government of France is far behind in the establishment of telegraphs, and it has always thrown obstacles in its way. The "National" paper complains as follows about it, in which it appears the philpsopher Leverrier receives and deserves censure:—

"It is in vain that all foreign nations are rivalling each other in activity to realize this marvellous invention which has placed the lightning at the disposition of the mail; our Administration has discovered the secret in making electricity itself go at a walk. M. Leverrier has put in the way the thickness of his own mind, and the most subtle of all fluids cannot get across it. A few odds and ends of wire stretched along the lines of railroads; a small office in the Ministry of the Interior, where a dispatch, subjected to the most inquisitorial formalities, and to an exorbitant charge, is transmitted by most wretched contrivance—this is all we possess; and you will yet see the galvanic fluid make the tour of the globe, passing by Moscow and Pekin, before there will be an electric telegraph between Lyons and Chalons-sur-Sone.

Now what is wanted to bring about this latter result! A line of poles planted along the line of the Soane, after the American manner—a thing of course out of the question.—To accomplish the first, you must span two oceans; yet the English will do it; and if they do not make haste the duty will devolve upon the citizens of the United States. The question is already under study, and the submarine wire that connects the two shores of the Channels is only a specimen, by way of trial. If, in the execution of this new work, French engineers are condemned to inaction, they can at least assist by their ideas, and it is in this view we must receive a proposition made by one of the them to the Academy of Sciences; M. Aristide Dumont, applying to the ocean telegraph the observations he has made upon the land wires, proposes to suspend the electric cable to floating buoys instead of laying it upon the bed of the sea or sinking it to a certain depth. This original idea developed by the author and supported by numerical calculations, deserves the attention of the engineers, who, in bringing together the two shores of the country are to accomplish the most splendid industrial work of the country."

Atmospheric Pressure as a Telegraphic and Mechanical Agent.

The Southern Press referring to the paragraph recently published, stating that experiments were making on a section of the Boston and Providence Railroad, to test the practicability of sending letters to a distance by means of atmospheric pressure, says:—

"A friend of ours possesses an invention of a very similar character, which we think he should take measures to bring out and verify by experiment. Taking the description given to be tolerably correct, some difficulties suggest themselves to our mind, which the invention of our friend seems to us to overcome. We should be glad to know the results of experiments made with both plans. The one we have alluded to combines the advantage of transmitting letters and newspapers in a small compass, with that of application on a large scale to the transmission of goods and passengers.

The importance of such an invention can hardly be overrated; and if experiment shall prove it to be practicable, it will completely change the present system of railway travelling. The construction of the road would be cheaper—the speed would be vastly increased, while the danger would be less. At the same time, by our friend's plan, the cars can cross from one set of lines to the other without any difficulty, an object hitherto unattainable upon atmospheric roads. The invention would have been put to the test of experiment long ago, had not the inventor been deterred by the expense. We consider it very worthy the attention of monied men, who interest themselves in such matters."—[Boston Journal.

[In 1823 a plan was proposed in the Glasgow Mechanics' Magazine, for sending parcels through an air tight tube by exhausting it at one end by an engine. A few years ago a a plan was tried in France of working machinery by compressed air driven through a tube two miles long, worked by a water wheel—a cheap power. The plan was plausible but failed entirely to produce the mechanical results anticipated. More than one atmospheric railroad has been tried in England on a large scale. They have all failed. To employ compressed air as a mechanical agent through a long tube, is like employing an exceedingly long belt or chain, which is well known to be impracticable beyond a given length. For short distances, atmospheric pressure and exhaustion can be made to work very well, and in one coal mine in Glasgow, Scotland, the principle has been very successfully applied in what is termed Potts' Atmospheric Pile Driver.

A Japanese Compass.

Captain Lee, of the schooner Elizabeth, which recently arrived at this port from San Francisco, brought a curiosity of the most rare and interesting character. It is the compass that was taken by the captain of the bark Auckland, from the Japanese junk, the crew of which vessel, with some of its effects, were also taken and conveyed into San Francisco, as has been before reported. Capt. Jennings, of the Auckland, having been a schoolfellow of Captain Lee, presented him with this singular piece of mechanism, as a token of esteem and memento of former times. It has, instead of a floating card, like that of the mariner's compass, a needle similar to our little surveying pocket compass needles. It has the different points marked on the top of the box in Japanese characters, being sixteen in number. Capt. Lee designs sending it to Washington, to be placed in the cabinet of curiosities in the Patent Office.

No Evading the Tolls.

The Circuit Court, of Washington county, Md., decided lately, that no one has a right to pass round a toll-gate with a view to evade the payment of the toll; and that nothing but absolute business can be pleaded in justification of such a violation. C. Hildebrand, the defendant in the case, was fined $2 and costs, by a magistrate, for going round the toll-gate to avoid paying three cents toll, and the Circuit Court sustained his decision.

California Quicksilver.

The New Almaden quicksilver mines are now in full operation, giving employment to two hundred or more of laborers, and yielding about 10,000 pounds of quicksilver daily. The company are excavating a passage into the hill from which the cinnabar is taken, through which, by means of cars, it can be run out more rapidly than by the present method, and with greater case to the workmen. This improvement will cost the company a large amount of money, but when completed will greatly facilitate their operation. The ore is now raised to the surface by shafts, and brought down the steep hills on pack mules.

The Burial Place of John Fitch.

We have in this place many excellent mechanics. Messrs. Russell & Sisco, your subscribers, especially. A Mr. John Carothers, who has recently died in this place, has left on hand many new and curious articles as yet unfinished, among which is an immense machine by which he intended to make bricks at the rate of 46,000 per hour, and the amount of work already done has amounted to over $1,000, to have finished it would have cost $5,000; in its success he had the fullest confidence; there are also unfinished machines for making sausages, cutting lard, meat, &c. A Mr. Lilly, though kept down by poverty, is administering to the pleasures of farming by his great improvements in the agricultural implements. Here is the native place, and not two hundred feet from where we now stand, is the grave of the unfortunate John Fitch, the first real inventor of the steamboat navigation. Before Robert Fulton was ever heard of, John Fitch exhibited to wondering crowds a miniature steamboat which glided swiftly across a large pond in the vicinity of this place. Poverty, and the incredulity of his fellow-citizens, have made him lose that position among the great men of the country which he so greatly deserved.

The writer of this boasts himself a mechanic by nature, and wavered sometime as to whether he would become an apprentice to Mr. James Carothers or not, but want of industry predominated, and he can boast of nothing now but some new ideas in the way of rat traps, &c. E. & Co.

Bardstown, Ky.

To Promote Adhesion in Locomotive Wheels.

Mr. Editor.—Having noticed several complicated plans for increasing the "bite" of locomotive wheels, and having myself frequently witnessed the difficulty in starting heavy freight trains from the slipping of the wheels of the engine, the following simple plan has suggested itself to me, and not knowing if it has ever been tried, I submit it to your judgement, with the liberty of offering it through your paper to builders of engines, if you think it worth anything:—I would run from the back end of the engine frame a stout piece of timber well secured to it, under the front end of the tender, just low enough to clear the frame of it. Through the front end of the frame of the tender, I would insert a stout screw running down into a pivot bearing on the timber spoken of, with a suitable arrangement on the upper part of the screw for turning it with the necessary force. The operation of this simple arrangement would be thus. When the engineer wished to make his drivers "bite harder" for the purpose of starting a heavy train, he would turn the screw down into its bearing sufficiently to place the weight of the end of the tender upon the back end of the engine, and of course upon the driving wheels, as soon as the train is in motion, a backward turn of the screw places matters as they were before. It seems that this simple arrangement will work better than many of the complicated plans I have seen. G. T. W.

Hartford, Conn.

[In No. 27, Vol. 1, Sci. Am., there is an engraving of Dr. Lewis's locomotive for increasing the bite on the rails. He employed extra small wheels, and by a screw could throw the weight on to them in the same way as that proposed above. The freight engine which won the prize at the Lowell Mechanics Fair, had a great amount of driving surface, and it started with its load without the least hesitation, while others found great difficulty in so doing.

A Great Blast.

One of the most gigantic engineering operations ever effected, took place, says Galignani, a few days ago, near Welschmetz, in the Italian Tyrol. A quantity of stone being required for the construction of viaducts and bridges for a railway, it was resolved to use a huge rock, 360 feet high, and 85 feet wide, which rose like a wall. In two places only was this rock connected with the chain of Alps. First of all it was entirely separated from the mountain (a very difficult operation, which occupied 800 workmen for some time); then seven or eight large openings were effected at the base, so that the immense mass was supported on columns; and then trains of gunpowder were placed in each opening.—Everything having been prepared, fire was set to the trains. In eleven mintes a frightful explosion took place, and the mass came down. The fall shook the earth for a distance of nearly two leagues, and the pieces of rock spread over nearly ten acres.

To Our City Patrons.

Those of our subscribers who reside in the lower wards of the city, and who have not received their papers regularly for the past few weeks, are informed that a new carrier has been placed upon the route who will in future serve the paper promptly.

Subscribers will oblige the publishers by rendering all possible aid to the new carrier, who will in turn serve them with the paper regularly and in good condition.

Any omission which may accidentally occur will be promptly corrected by registering the complaint upon the carrier's book at the office.

Cure for Headaches.

A work has been published in Paris, by an eminent physician, in which is described a new remedy for headaches. He uses a mixture of ice and salt, in proportion of 1 to ½, as a cold mixture, and this he applies by means of a little purse of silk gauze, with a rim of gutta percha, to limited spots on the forehead or other parts of the scalp, where rheumatic headache is felt. It gives instantaneous relief. The skin is subjected to the process from half a minute to one and a half minutes, and it is rendered hard and white. It is said to be good in erysipelas and diseases of the skin.

The Magnetic Telegraph Predicted.

At a banquet given on the occasion of the opening of the sub-marine telegraph between England and France, Mr. John Brett stated that it was over a cup of tea, early in 1845, that his brother and he first discussed the project, the successful completion of which they were then celebrating; and in the month of July, in the same year, they drew up a plan for not only uniting England and France, but Ireland, and the most distant colonies in India. Some of the most eminent engineers, he said, regarded the scheme as impracticable; but the jest of yesterday was the fact of to-day. Mr. Brett mentioned the remarkable fact, that in 1666 one Gilbert published a book, in which he said that the day was not far distant when men would be able to communicate from one end of the world to the other by means of electricity. This prediction may now be said to be in course of realization, if not actually realized; and Mr. Brett believes that "not only Paris and Vienna, but Constantinople, Calcutta, Pekin, and America, will in a few years be next-door neighbors."

Suspension Bridge Over the St. Lawrence.

Mr. E. W. Serrell, C. E., of this city, has been employed by the corporation of the city of Quebec, to ascertain the practicability of throwing a bridge over the St. Lawrence. He has made an examination and reported that a suspension bridge across that river is perfectly practicable in a scientific point of view at about 6 miles above Quebec. The span would be 1,600 feet, and the roadway 160 feet above the water; this we believe would be the largest suspension bridge in the world.

Spontaneous Combustion.

At a recent trial at the Capital of the Grand Dutchy of Hesse Darmstadt, in which the question of the possibility of spontaneous combustion of the human body was involved.—Profs. Liebig and Bischoff were called to give evidence on the subject; the evidence of these two eminent chemists, was opposed to the possibility of such an occurrence.

Railroads in England.

There are 6,464 miles of English railroads constructed, at the cost of £205,160,000; the number of Engines working on them is 2,436; the average distance run per day being 110,333 miles; the profits on the traffic paying from £11,000,000 to £11,500,000 to the shareholders.

The Assembly of Citizens, of Bremen, have resolved to send, in the name of that city, a stone with a suitable inscription, for the monument about to be erected at Washington in honor of Washington.

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[For the Scientific American.]

Motion.

[Concluded from page 99.]

Causes and effects are relative terms: the cause produces the effect, and the effect results from the action of the cause. Causes and effects are both distinguished into primary, secondary, etc.; or into immediate, mediate, and remote. Thus,—when the sun's heat rarifies the air in any particular place, making it lighter, that rarefaction causes the surrounding denser (heavier) air to rush in and restore the equilibrium, producing wind, and the wind impels a ship forward. In this case the wind is the primary or immediate, the rarefaction is the secondary or mediate, and the sun's heat the remote cause of the ship's motion.

The causes of the motion of bodies are called forces. Forces are either impulsive or constant, or both combined. An impulsive force puts a body in motion, and then lets it move by its own inertia. In this case the moving body passes over equal distances (spaces) in equal times, and its motion is therefore said to be uniform. The motion of a cannon ball would be uniform and rectilinear if it were not resisted by the atmosphere and attracted by the earth. But the former retards motion, and the latter converts rectilinear into curvilinear motion; so that we have no natural uniform motion on earth, unless the moving body be supported by another; nor any rectilinear motion, except when the body moves perpendicularly to the earth's surface. A constant force continues to act upon the moving body after it has put it in motion, causing it to move faster and faster every moment; and this is called accelerated motion. If motion increases equally in equal times, as that of a body falling towards the earth's surface is increased, it is said to be uniformly accelerated; and, if equally diminished in equal times, as is the motion of a ball shot towards a star in the zenith, it is said to be uniformly retarded.

Water or steam propelling machinery, and the wind acting continually upon the sails of a ship, are constant forces; and each of them would produce accelerated motion if the velocity of the water where it strikes the wheel (being produced by the uniform pressure in the penstock) were to increase also. The celerity of a ship, propelled by wind or steam, is rendered uniform by the constant resistance of the water, which increases as the square of its velocity, Motion produced by steam is regulated by a governor, which proportions the quantity of steam, permitted to act, to the motion desired, and the motion of all machinery is retarded by the passive and constant force of friction.

When an impulsive and a constant force act upon a body conjointly and simultaneously, they produce curvilinear motion around the centre of the constant force, which emanates from that centre; and the path in which the body moves is called its orbit. The simplest sensible demonstration of curvilinear motion is produced by whirling a weight, tied to one end of a string while the other end is held fast in the hand, around one's head. It will then be observed that the weight manifests a constant tendency to fly off by pulling the hand towards it, which increases in proportion to the velocity with which the weight is whirled; and that the weight will fly off in a straight line, called a tangent to the curve in which it moves, when the string is suffered to slip from the hand. This tendency of the body to fly off is called its centrifugal (centre-flying) force; and the force with which the hand holds the string, is denominated centripetal (centre-seeking) force. It will also be observed that, to set the weight in motion, the hand must first, itself, be moved in a curvilinear direction, and then, to keep it moving, the hand must be moved in a reciprocating (backward and forward) direction. Therefore the weight moves in an elliptical orbit; and, consequently, during one half of each revolution, the centrifugal force predominates over the centripetal, and the centripetal over the centrifugal during the other half; and, at two points in each revolution, *i. e.*, when the weight is equidistant from the centre of motion. these two forces precisely balance each other; whereas, in a circular orbit, the centrifugal and centripetal forces will be constantly equal.

If two bodies, of unequal weight, be impelled by the same force, the heavier will move with the least velocity, because the striking force (momentum) of a body, which is always equal to the force that has set it in motion, is proportional to the product of the weight of the body and its velocity. Consequently, if two cannon balls, of unequal weight, be connected by a chain, and fired from a cannon, the lighter ball will move the fastest, and, being held back by the heavier, the former will revolve around the latter, drawing it gently towards itself till both revolve around their common centre of gravity, which will move in a straight line, influenced only by the force of gravity.

A moving body cannot impart a greater momentum to another body, or yield more force than that which has set it in motion; otherwise it must be conceded that inanimate matter can generate moving mechanical force, and consequently, that it can move itself, which is contrary to all experience.

Now, in the case of the string and weight, the impulse is communicated to the weight by the hand; and the momentum generated by this impulse is manifestly decomposed into the centrifugal force of the weight and the force with which the weight would strike an obstacle in its orbit; and each of these two forces must therefore be less than the force which first moved the weight, because the sum of the two former is only equal to the latter. If this position be true, and we should like to see it invalidated, it will be difficult to conceive whence and how Esquire Andrews can derive any greater mechanical force from the centrifugal part of circular motion than is necessary to create the circular motion. Can a part be, in any case, greater than the whole?

H. R. Schetterly.

Howell, Mich.

Recent Foreign Inventions.

Tanning.—Mr. James Pyke, of Westbourne Grove, Bayswater, Eng., has taken out a patent for the following improvements in tanning:—

The first part relates to the preparation of the tanning liquor, and consists in an improved mode of extracting the tannin principle from the bark, by the application of heat, which greatly facilitates the operation. The extraction is made in a suitable vessel or tank, in the following manner:—The tank is provided with a false bottom, a few inches above the proper bottom, it is closely perforated with moderately small holes, and between the two bottoms, one or more pipes are ranged, into which either steam or hot water is admitted, thereby communicating heat to the contents of the tank; the bark is placed in the upper part of the tank, above the false bottom, and the liquor, when the tannin has been sufficiently extracted, is drawn off from beneath the false bottom. The temperature to which the liquor should be submitted while in the tank, should be 150° to 200° Fah. During the operation, the atmospheric air is prevented from having access to the interior of the tank, by having the lid or cover of it fitted on in an air-tight manner; the edge of the tank having a hollow rim containing water, into which a projecting flange upon the underside of the lid dips, thus forming a water-joint. When the liquor has been run off from the tank, and allowed to cool, it may then be used in the usual manner.

Another improvement consists in submitting the hides after the tanning process has been performed, and yet in a wet or damp state, to the action of rollers, so as to consolidate the leather, and express from it the superabundant moisture. The rollers which the patentee employs for this purpose are not simply metallic rollers, as usual, but a combination of metal and elastic material. The object of this is to provide for the unequal thicknesses of the hides, by allowing the rollers to yield when the thicker parts are passing between them. The rollers are composed as follows:—Upon a carrying shaft a cylinder of India-rubber, or other elastic material, is mounted, and over this a series of narrow metal rings is fitted somewhat tightly, and plates at the ends secure the whole together. In using these rollers, when a thicker part of the hide comes between them, the rings at that part will be pressed upwards; the India-rubber beneath them yielding to the increased thickness. Therefore the pressure will be equal over the whole surface of the hide, whatever the thickness may be. In place of employing two rollers thus, one roller and a flat surface may be used; the roller being of solid metal, and the flat surface composed of an India-rubber bed, upon which bars of metal are longitudinally arranged. The effect, however, of using them, will be the same upon the hides.

The second part of the specification relates to the manufacture of boots and shoes, and consists in forming the shoe upon the last, and attaching the sole-leather to the upper by means of pegs or nails. The leather to form the upper is forced by a press on to a last of the form required, and into a mould, being the counterpart of the last, and the edges of the upper leather are brought over it. The sole leather is then applied, being previously cut to the exact size, and the whole placed in a press; but over the sole is first placed a block or plate, containing the nails or pegs; and when the press exerts its pressure upon this, the points of the nails will pass through the sole, and the edges of the upper and the inner sole, and coming against the steel edges of the bottom of the last, will turn or clench them, thus firmly securing the whole together.

Soda from Salt.—Mr. William Cook, C. E., of London, has recently taken out a patent for the following method of making soda:—He places a solution of common salt between two metals, iron and copper, connected together in a voltaic battery; the salt is decomposed at the expense of the iron, its chlorine combining with the metal to form chloride of iron, whilst the sodium enters into combination with the oxygen of the water, forming caustic soda; the other constituent of the water, the hydrogen, passing off in the gaseous state.

The caustic soda thus produced goes in the direction of the copper, and in order to prevent the amalgamation of the two solutions, (chloride of iron and caustic soda) a diaphragm, constructed of some suitable porous material, is placed betwen the iron and the copper, the solution of salt being placed in that part of the apparatus used to contain the iron, and clean water put on the sides at which the copper is situated, in order to receive the caustic soda produced by the decomposition of the salt.

In order to ensure the decomposition of the salt, two conditions are essential to be observed—viz., that the temperature of the saline solution be between 70° and 150° Fah., and the access of the atmospheric air prevented; otherwise the chloride of iron will become converted into oxide, and the salt be recomposed as fast as it is decomposed, thus rendering the process of no utility.

The patentee then proceeds to give the following instructions for carrying out the process on the manufacturing scale, as for the preparation of a ton of soda ash:

For this purpose, a cistern or tank is constructed of stone, slate, or other suitable material, not liable to be acted upon by caustic soda, the dimensions of which are 11 feet long, 6 feet wide, and 3 feet deep. It is divided into three compartments, by means of diaphragms, formed of some suitable porous material, such as biscuitware or unglazed earthenware. These diaphragms run the full length of the cistern, and are so placed, that the middle compartment is 1 foot wide, and the two outer compartments each 2½ feet in width.

The diaphragm may be formed of two gutta-percha frames, constructed like ordinary window-frames, but provided with panes of biscuitware or unglazed earthenware instead of glass. Each diaphragm to be of the same length and depth as the cistern, and made water-tight. The panes of porous material employed should not be of greater thickness than one-eighth of an inch.

The cistern being thus ready for use, pigs of Scotch iron are placed in the two outer divisions or compartments of the cistern or tank, in such a manner that the salt water may touch as much of their surfaces as possible. A small portion of each pig of iron is also filed bright, so that perfect metallic contact between each piece of iron may be ensured, by placing the bright part of one pig in connection with the bright part of the one next adjoining.

The number of pieces of iron employed to be as many as will leave room for the addition of 324 gals. of salt water, which must next be placed in each of the compartments containing iron. Two plates of copper of the same dimensions as the length and depth of the cistern, are to be placed at each of the two porous diaphragms, at a distance of a quarter of an inch from them. Either copper foil or copper plate of any thickness, may be employed for this purpose, as surface only is required, no action on the copper taking place in the process.

Each piece of copper must be connected with the pig of iron nearest to it, by means of a strip of copper bent over the diaphragm, and fastened by means of a screw or other suitable means, in connection with the bright part of one of the pieces of iron in the outer compartments, with a view of ensuring that full metallic contact which is necessary to the success of the operation.

For the manufacture of a ton of soda-ash, a solution of 2,489 pounds of salt in 474 gallons of water is employed, half of which is placed in one of the outer compartments containing iron, and the remainder in the other.

The middle compartment containing the copper, is filled with clean water up to the level of the salt-water in the two outer compartments.

In order to prevent all access of air, a cover is fitted to the decomposing vessel, and securely luted. A bent tube to carry off the hydrogen gas, liberated in the process of decomposition of the water, is inserted in this cover, the end of the tube being conducted into a vessel of water to prevent any access of air through the tube. The contents of the tank being continuously kept at a temperature of 70 deg. to 150 deg. Fah., the decomposition of the salt will be effected in the course of seven days, when the two other compartments will be found to contain a solution of chloride of iron, and the middle compartment a solution of caustic soda mixed with a small quantity of salt. The strength of the soda solution will depend on the quantity of water employed; but if all the salt be decomposed, the solution will be found to contain 1,327 pounds of dry caustic soda.

Prof. Page's Electro-Magnetic Engine.—This Engine, which was illustrated in No. 9, of this volume of the Scientific American, has recently been patented in England as a "Communication," by John J. Greenough, Esq., of Washington. The motive power of the invention is denominated in the specification "Electro Dynamic Axial Power." The elementary principle on which this invention is based, is that of the axial force by which a helix, containing an electric current, draws a magnet within it in the line of its axis, the magnet at the same time reciprocating the action of the coil in an opposite direction. There are no less than twenty-two claims in the patent: one is for a succession of coiled magnets in a line, to give a straight bar a direct motion, or a curved bar a rotary motion. Square wire to form the coils is also claimed, when such wires are wound helically backwards and forwards over the entire length of the coils. A succession of small hollow coils, to be cut off one after another, throwing the current ahead, as the bar moves along, forms another claim.

We are indebted to our invaluable exchanges, "Newton's Repertory of Arts," "Patent Journal," "Mechanics' Magazine," and other London Journals," and to the "Genie Industriel," &c., of Paris, for the above, in substance.

Newspapers in the United States.

By the returns of the last census, it appears there are about 2,800 papers in the Uinted States, of which 2,000 are published in the Free and 800 in the Slave States. About 850 are Whig, 750 Democratic, 70 Free-soil or Anti-slavery, 20 Agricultural, 40 Temperance, 200 Religious, and 870 neutral and miscellaneous. New York has 443 papers, Pennsylvania, 328, Massachusetts 212, Ohio 300.

To Cure Nose Bleeding.

Roll up a piece of paper and press it up under the upper lip. We have tried this plan in a great number of cases and have only seen it fail on one occasion.

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NEW INVENTIONS.

Registering Blocks for Printing Oil Cloths.

Mr. James Jenkins, of Elizabethtown, New Jersey, has taken measures to secure a patent for an improved mode of registering blocks for printing oil cloths. This invention consists in registering the blocks by means of guages secured at two of the corners of each block, and which are so arranged as to slide in a direction parallel with the edge of the block that faces the stock. A screw rod, having its outer end pointed, works in a female screw in a collar of each guage. The points of these rods fit in vertical grooves made in slides, said slides being placed in a stock and working in a cleet attached to it. The slides are secured permanently to the cleet and stock at required distances by screws. By adjusting the slides properly on the stock, also the guages which are attached to the blocks, each block will register in a perfect manner as it is pressed upon the oil cloth.

Improved Bed for Invalids.

Mr. L. Johnson, of Chicopee, Hampden Co., Mass., has invented and taken measures to secure a patent for an improved bed for invalids, whereby one end of it can be elevated by a movable frame immediately under the bed, so as to raise up the head of the invalid to any desired height. The lower end of the frame spoken of is attached to the bottom of the beadstead or to the side rails by hinges. To the side pieces of the movable frame are attached levers projecting downwards, one lever to each side piece; these levers are attached to the side pieces by hinges or some elastic material. At the lower end of each lever, there is attached a piece of webbing or other suitable substance, which is attached to and passes around a shaft running transversely underneath the bottom of the bedstead; the bearings of said shaft being on or suspended from the side rails. By turning the shaft by means of a crank, the webbing is wound up on it, and the levers are drawn upwards and the frame elevated. The frame is held in the desired position by means of a pawl bearing against notches for that purpose.

To Manufacture Resin Soap and Purify Turpentine.

Mr. Charles J. Meinicke, of this city, recently secured a patent for the manufacture of a good resin soap, and for the purifying of turpentine at one operation. The process is, to take a thousand pounds of crude turpentine and melt by steam or otherwise, and add eight hundred pounds of tallow, grease, or fat. When both are in a perfect liquid state, eight hundred parts of liquid soda, containing thirty per cent. of dry soda, dissolved, is added and stirred up, the temperature of the whole being increased at the same time to 108° centigrade thermometer. At this temperature the soap is instantaneously formed; the acids constituting the rosin of the turpentine, and those forming the grease being perfectly neutralized by the alkali, and thus converted into liquid melted soap. The essential oil of turpentine is set free at the same time, and in order to obtain the same, a solution of common salt is added, which is necessary in the manufacture of all soap. The soap kettle is then connected with a condensing apparatus, usually employed by distillers of the spirits of turpentine, and then the temperature of the whole is increased to the boiling point. The essential oil of turpentine and the steam, pass into the worm and are condensed. The alkali sets the spirits of turpentine free, and in this manner two articles of useful manufacture are produced with less expense for fuel and labor; such products, when made separately, as now practiced by soap-makers and turpentine distillers, cost more time and expense.

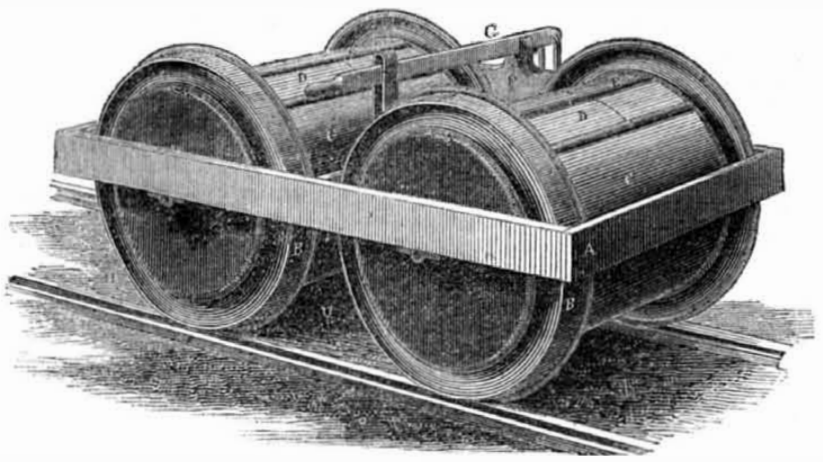
When all the essential oil is distilled over, the remaining soap is finished in the common way now practiced by all soap-makers.

The claim is for distilling turpentine so that the spirits of turpentine are distilled, and the rosin saponified for soap making at one operation. Excellent soap, we are informed, is made by this process, and the invention must be considered as a new and useful discovery. We are glad to know that a great many chemical patents have been applied for within a few months. The discoverers should be amply rewarded for the same.

Woven Cartridge Bags.

We learn from the Portsmouth, N. H., Journal, that John Prindar, of that city, has succeeded in making cartridge bags for cannon of various calibre, with a perfect hemispheric end, woven throughout without seam. The bags are of the texture of fine kerseymere, and are pronounced by the best judges exactly the article needed for gunnery. He is about taking means to secure a patent. Efforts have frequently been made in various parts of New England to weave such bags, but heretofore they have been without success. Over $20,000 was spent by one company in Boston in the effort, and it was then abandoned.

PATENT RAILROAD CYLINDER CAR FOR COAL, &c.



This is the invention of Mr. Laurence Myers, No. 18 Wallnut st., Philadelphia, and has been secured to him by patent. This figure is a perspective view. This car consists of a frame, A, and two wrought iron cylinders, C C, of sufficient length to suit the track, with the felloe or rim, B B, of a railroad wheel, slipped over each end and substantially riveted to it. In the centre of each cylinder is placed a partition, the whole length and depth of the same. On the head of each cylinder is fastened the journal, which rests on, and works in boxes placed underneath the frame; they are thus connected together. D D are the doors which extend lengthwise of the cylinders. Each door is in four equal parts, and hinged in the usual manner, and is secured by an iron rod, E, passing through the wheels and over the same. F is a brake and G is the lever of it. The coal, or whatever the cargo may be, is placed through the doors in the cylinders. The contents thus revolve with the cylinder, and their abrasion is prevented, by the centrifugal force produced, by the usual velocity attained on railroads, and the partition placed in the cylinder also effectually prevents the same during the necessary slow motion on the road. Respecting the value of this invention, John Tucker, Esq., President of the Philadelphia and Reading Railroad said about it.

"It is the general opinion that this car stands unrivalled for the transportation of coal, grain, lime, &c., and that it will prove invaluable not only for its general economy, but the speed with which these articles may be brought to market. The distance from Mount Carbon to Port Richmond is about 63 miles, and owing to the crowded state of the road with cars at that time, in consequence of the destruction of the canal, we were 9½ hours on the road, and, notwithstanding, the loss did not exceed 1 per cent.; the actual loss with the the ordinary cars is said to be 3 per cent., and 5 is the usual allowance to the company.—The condition of the coal dumped at Richmond was excellent."

It is a car of great simplicity of construction, and the large wheels necessary on cars of this construction, also materially enhance their superiority, and consequently will run much easier and lighter, with less injury to the road, and, it is the opinion of many gentlemen well informed on the subject, will rather improve the road, by its solid steady movement, where the tendency is now to destroy. The speed, when and where deemed practicable, may be increased from twelve to twenty-five miles per hour, or more, without materially increasing the friction on the journals, thereby greatly economizing time and fuel of the locomotive.

The whole weight being directly on, and in such close proximity to the road, the liability to run off the track is immeasurably lessened. The facility for loading these cars is equally as good as those now in use, simply by placing in or on the face of the railroad track, at the point of receiving freight, four friction rollers for each cylinder, to be run on, in order that should the door be down when it should be up to receive freight, it may very readily be brought in proper position by turning the cylinder, and the facility to do so, is in proportion to the diameter of the friction rollers, which are adjusted in some respects as the grindstone is most usually, in machine shops. The weight is brought low down to the rail, and the locomotive is enabled to draw a greater load than by common freight cars.

More information about rights, &c., for this invention, may be obtained by letter addressed to the inventor and patentee, as above directed.

Submarine Railroad.

A gentleman of London, named Hector Horeau, has proposed to build a submarine railroad between France and England. The plan is to construct a tube of strong plate iron, and place it on the bottom of the Channel, which is twenty-one miles wide, between the two countries, and the water is not deep in the Straits of Dover. It is proposed to propel the carriages by stationary engines at the ends of the tube. It is proposed to have strong glass windows in the tube, to light it up by day, and at night it can easily be lighted with gas. Air can be forced through it so as to keep the atmosphere always pure. A light-house placed on each coast, and a number of floating buoys, will indicate the track of the tube, above the water, so as to prevent mariners casting anchor near it. The plan appears to be feasible, and we hope it will be carried out and add a new tribute to the genius and skill of the Civil Engineer—England's master-spirit.

Perpetual Motion.

The "Courier de la Gironde," France, states that a civil engineer of Bordeaux, named De Vignernon, has discovered the perpetual motion. His theory is said to be to find in a mass of water at rest, and contained within a certain space, a continual force able to replace all other moving powers. The above journal declares that this has been effected, and that the machine invented by M. de Vignernon works admirably. A model of the machine was to be exposed at Bordeaux for three days, previous to the inventor's departure with it for London. We suppose that this will make the 999th perpetual motion that has been discovered, all of which deserve any other name than perpetual. This new one is a static pressure, we see. The Frenchman must have stolen some of Sawyer's thunder, but it will soon be silent enough.

New Knitting Machine.

We learn by the Philadelphia Ledger, that Mr. J. H. Barsanter, of Lowell Mass., is now exhibiting in the Philadelphia Exchange, his excellent knitting machine. It knits three hundred and eighty stitches at each turn of a small crank, which crank may be easily turned by hand from one hundred to one hundred and fifty revolutions per minute, making from forty to sixty thousand stitches per minute, or at the rate of about three million per hour.

Beardslee's Patent Planing Machine.

On Friday afternoon last, in company with several scientific gentlemen we visited the steam planing mill of Messrs. Fitch & Coffin, North Point, in Jersey City, where we had the pleasure of witnessing the operation of Beardlee's Planing Machine, illustrated in No. 3 of the present volume. In the description accompanying the Planing Machine, we expressed an unqualified opinion respecting its merits; these opinions were based upon a knowledge of the principles involved in its construction, and upon representations made by our reporter, who was dispatched to Albany where he witnessed its operation. We do not intend here to specify the peculiar points of difference between this and other well known machines, as our readers can readily examine into them by reference to the engravings.

We wish only to deal with it as an operating machine, and in so doing we do not intend to injure any one's interests, or become the especial champions of any one's cause, our business is with the public, and upon the public we have not vainly relied. For two hours we carefully watched the operation of the machine in reducing and planing boards, and are satisfied to rest upon the opinions expressed in a previous number—the result pleased us very much. The surfaces of the boards were left smooth and unexceptionable, although considerable of the lumber was well interspersed with knots. We were informed by a gentleman present that 200 feet per minute could easily be planed, and also that 6,000 feet of a different shape and thickness had been run through a machine without the change of a single knife.

We believe it will prove itself a valuable and useful improvement—its operation on Friday fully warrants this opinion. A matcher of peculiar construction operating on the line-cut principle was also running in the same mill, and jointed, tongued and grooved as many boards as the planer could furnish. We matched several of the boards, and could see no objection to the work produced. We need not enter into a description of the matcher here; suffice it to say it operated satisfactorily, and we hope before long to present an engraving of it to our readers. Mr. Beardslee will be stopping for a few days at the "Girard House," corner of Chambers street and West Broadway, N. Y.

Double Piston Engine.

Mr. W. W. Virdin, of Havre de Grace, Hartford Co., Maryland, has invented and taken measures to secure a patent for improvements in the steam engine, which relate to the employment within the same cylinder of two pistons, entirely independent of each other, and whose piston rods pass through opposite ends of the cylinder. One piston rod connects directly through a connecting rod, to a crank on the main shaft and the other piston rod is furnished with a cross head, which is connected by two long connecting rods, to two cranks on the main shaft, whose position on the shaft is diametrically opposite to that of the first named crank. The cylinder is furnished with steam and exhaust ports at each end and the middle, and steam is admitted alternately between the two pistons, and the cylinder ends, and both pistons through their connecting rods act simultaneously on the cranks and revolve the main shaft.

Improved Smut Machine.

Messrs. Charles and James Keeler, of Union, Broome Co., N. Y., have invented and taken measures to secure a patent for improvements in smut machines.

The air is admitted into both ends of a hollow cylinder or drum, and the wind passages are constructed in such a manner as to allow of their being turned to either side to allow the machine to be driven in either direction.

Singular Accident by an Oil Can.

The Genesee Courier, of the 6th inst., relates that on the preceding day, Mr E. L. Stanley, of Le Roy, N. Y., while engaged in oiling a portion of the machinery of a planing mill slipped and fell on the sharp point of an oil can which he held in his hand, the point penetrating the head just above the eye. He remained insensible some twenty-four hours, and it was feared the wound had affected the brain and would prove fatal.

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NEW-YORK, DECEMBER 20, 1851.

New Motive Powers---Steam.

We have noticed, in a number of our contemporaries, very flattering remarks and very bright hopes held out, of numbering steam-power, some of these days, with the things that were. We are told that Mr. Taggart, of Massachusetts (the same gentleman, we suppose, who lost his balloon in Jersey City, much to our regret), has invented an engine which he propells with the force of gunpowder. One of our cotemporaries asserts that the principle of his application of powder to propel machinery, is radically different from all others who have tried the same substance for the same purpose; and that it is calculated to effect a saving of ninety per cent. over the steam locomotive.

Another, in descanting upon the Electro-Magnetic Engine of Prof. Page, says:—"The days of steam are numbered." Another alludes to that stupid invention, founded only on the tremendous assurance of its advocates—"the Static Pressure Centrifugal Force Engine," and asserts "that power, to any extent, free of all cost, may be maintained by it." Another alludes to the Caloric Engine of Capt. Ericsson, of this city, and asserts that the power in it is maintained at one-third the cost of the steam engine. Another mentions the Carbonic Acid Gas Engine, of Mr. Salomon of Cincinnati, and hopes that it will supersede the steam engine.

With so many antagonists in the field, our good old friend, the Steam Engine, seems to be rather shabbily treated, and his claims rather sneeringly set aside. We have published illustrated descriptions of three of the inventions intended to supersede the steam Engine, viz., the Static Pressure Engine, in our last Volume, and the Caloric and the Electro-Magnetic Engines, in this Volume. In our opinion, the steam engine is no nearer being superseded by any of these new motors, to-day, than it was twenty years ago. The only power deserving of attention among them, is the Electro Magnetic Engine. That it may answer better in some situations than the steam engine, according to the state to which it has been brought by Prof. Page, we will not deny; for there is a power in electricity so great, in one sense, that it is beyond control. We cannot view power or mechanical force apart from motion—velocity—and the greater the velocity the greater the power. Quantity of pressure, or weight, and velocity, is mechanical force. We have, in electricity a body—if matter it can be called—which has a velocity greater than that of the rolling spheres; it remains for the future to apply this power economically; at present we prefer steam boilers to galvanic batteries.

To get a power at no cost, by what is termed centrifugal force, is a delusion that never can be entertained, and never was entertained by a man of sound intellect.

We are willing to be condemned more for speculative than just conclusions, if the Caloric engine of Ericsson proves to be anything but an ingenious delusive piece of mechanism; a year or more will prove this better far than tongue can tell.

We do not know how the carbonic acid gas engine of Mr. Salomon is constructed, nor the gunpowder engine of Mr. Taggart. Carbonic acid gas has been tried long ago, but in every sense of the term it must be more expensive than steam; aye, and let us say more dangerous. And what of gunpowder? We are sorry to see Mr. Taggart expending money and time on such a project. It is more dangerous, more troublesome, and far more expensive than steam. Gunpowder has been tried frequently, as a motive engine power, but from its very nature no chemist would ever think of comparing it with steam. A cubic inch of powder expands to 2000 in gas, and a cubic inch of water to 1700 in steam, there is only a difference of 300 cubic inches, and that one of our cotemporaries, somewhat devoted to locomotive science at least, could hazard the assertion, that gunpowder, in Taggart's engine, effected a saving of 90 per cent., implies a want of knowledge on the subject, or else a want of just caution in expressing an opinion. By estimating the expense of gunpowder as a fuel, it would cost about six times more than coal; it soon destroys all the iron work with which the compound gas comes in contact; in short, it is a dirty gas to use, and is totally unfit for use, in comparison with steam, as a motive force.

All these new forces cannot diminish the size of an engine to perform the same work, no alteration can be made in its dimensions, and although some may hold it to be a complicated machine, we must say that it is very far from being as complicated as any of the engines we have enumerated. Coal and the steam boiler are the magazines of force which the inventors of new powers wish to dispense with, it would be well if they looked for better substitutes, but this they have not done. We would heartily rejoice to see a better and cheaper motive force than steam discovered and brought into use, but at the same time we must say the public are too often treated by those who are not familiar with such subjects, to far too many new motive powers to supersede the steam engine. It would be very wrong in us to assume the position that the steam engine cannot be superseded. We cannot tell what new discoveries are yet to be made; the past is full of astounding wonders, and so, no doubt, will be the future. There are things, however, with which we are acquainted; of these we speak, and speak because knowledge, reason, and candor to the public prescribe our duties in treating upon such subjects.

Re-Vaccination.

The New Jersey Medical Reporter, for December, publishes an address of J. P. Coleman, M. D., upon the subject of re-vaccination. He states that when vaccination was introduced fifty years ago, it was heralded as the best boon of medical discovery to man, as it was supposed that it effected an entire change in the system, and perfect immunity from variolous affections. "Experience," he says, "has dissipated those brilliant anticipations." In the majority of cases, he affirms vaccination only produces a partial change in the system, and leaves it open to both varieties of the small pox. No microscopic observation nor chemical analysis has yet disclosed the elementary principles of the virus, or the molecular condition of the system for which it has an affinity. There is a diversity of medical opinion respecting the value of vaccination, and the necessity for re-vaccination. One asserts that vaccination once well done, is sufficient for life; another that it will last only until puberty, and that re-vaccination is of but little account; a third asserts that it runs out every seven years, and should be as often repeated. The present Dr. Gregory, of London, a medical gentleman of great hospital experience in small pox, considers vaccination almost a perfect protection until puberty, when the liability to small pox returns and re-vaccination affords but little subsequent security. He therefore recommends innoculation, as small pox, by it, after vaccination, produces only a papular erruption, invariably safe. The statistics of Bavaria, however, and some other European states, where vaccination is enforced by law, show that small pox in any of its modifications, is almost unknown. A series of experiments were instituted in this city (New York) within the last fifteen years. The process consisted in re-vaccinating within a few weeks after the first application; many were found to be exempt from the action of the virus by the second application, while others inflamed moderately, and others again very severely. After an interval of some weeks, vaccination was again performed, and so on, each operation diminishing the number of cases, upon whom the virus acted; but one person required the sixth application before it ceased to affect him. When the vaccine matter failed to produce any effect, the persons were innoculated for the small pox without producing any effect.

The conclusion at which Dr. Coleman has arrived from experience in practice amongst others, and in his own case personally, is thorough vaccination, and that performed every few years; its frequent repetition on both the innoculated and vaccinated, may render the disease harmless, and it is the duty of physicians to attend to it for the safety of the people and the credit of the profession. The exact period most suitable for re-vaccination is not laid down, and this is correct, for it is impossible to prescribe for all in this way. One may want to be re-vaccinated in three and another not before twelve years.

New American Steamships.

A new class of steamships, peculiarly American, is now afloat, and the number of them is rapidly increasing. The peculiarity of this class of vessels is, they are furnished with upper beam engines, and in many points resemble our swift river steamboats. Their models are beautiful; they are truly keen of bow as a Damascus blade, and clean in the water-run. They are each furnished with two powerful engines, placed together, with the walking-beams above deck. The engine frames are very strong, and all the parts are well put together. These engines are cheaper and more simple in their construction than the side-lever kind. We do not know how they stand in comparison with the side-levers, for breakage and repairs. It appears to us that they must be subject to more breakage, but experience, in mechanical arrangements, is the only true method of proving this. These things cannot be arrived at by mathematical induction—practice is the only solver of such problems.

In 1846 we had only two American steamships, now we have no less than seventy or eighty, and the number is fast augmenting. The rapid increase of American ocean steamers, since the discovery of gold in California, is as great a wonder as the gold discoveries themselves. Something greater than we yet have an idea of must come out of this, we shall have steamers, in a few years, that will as certainly surpass the speed of the present steamers crossing the Atlantic, as the yacht America beat every one in the Royal Yacht Club.

Dr. Jackson on Patents.

When I read Dr. Jackson's address before the American Institute, published on page 51 of the Scientific American, it was my intention to notice one part of the same in the next number, but I delayed to do so, partly because I thought the subject would perhaps be touched more ably by Editorial hands. The point to which I allude, however, in the Doctor's address, may have escaped particular attention. It is that part of it which relates to the discovery of Niepce—the Daguerreotype—imparted by Daguerre to the Academy of Sciences in Paris. It is stated that an award of 6,000 francs per annum was voted as a pension to Niepce, the younger, and 4,000 francs per annum to Daguerre for "*the discovery and invention, and forever after it was to be free to all men and all nations.*" "Thus the world," says the address, "became forever indebted to France for the most beautiful art which has surprised this wonder loving age. Who that has taken out letters patent for trifling improvements in this art does not feel ashamed of himself when he contemplates this noble gift of the French nation."

Thus Dr. Jackson spoke, and his object was no doubt good and well intended,—which was the suggestion of an Institution, like the Paris Academy, to reward inventors. This he prefers to the Patent Office, respecting which he does not appear to entertain a very high opinion—rather a *patent* I should say. Institutions like the Academy are commendable, honorable, noble. I wish we had such an institution in our land; but while I could wish that inventors of new and useful improvements might be rewarded like Niepce and Daguerre, I must say that the generosity of such institution is liable to be abused, as was the case with this very discovery of the Daguerreotype, cited by Dr. Jackson. The Academy paid for the discovery, with the full intent to present it a free gift to the world; but was it really so? No. The discovery, as it is stated, was sold by Daguerre to be patented in England, and it was patented there, and never was a free gift to that country. It was doubly paid for; and the Daguerrean artists in America, while they have received the gift of the Paris Institute, never looked upon Daguerre as having done that which was truly fair in the premises.

All such institutions are liable to be imposed upon. The British Government paid a Dr. Birkenhout, in 1789, about $1500 for the discovery of a cochineal scarlet on cotton. It turned out afterwards that it was not new, and, worse still, it was worthless.

The intention of a patent to secure to the inventor, for fourteen or twenty-one years, the exclusive use, sale, and manufacture of his invention, is a legislative discovery of the greatest importance. It is just, politic, and in every sense has less faults than any other system that I know of for the encouragement of inventors, and for rewarding them in the least objectionable manner. In saying this much, however, I admire and commend the spirit of every institution which offers rewards for useful discoveries and improvements.

JUNIUS REDIVIVUS.

To Prevent Heating in Circular Saws.

MR. EDITOR—If your correspondent, "R. W. W., of Florida," would remedy the evil of which he now complains, he must so construct a small fountain of water that he can direct two jets (very small ones will answer every purpose), one on each side of the under part of his circular saws, when in motion. By so doing he will find himself wholly relieved from his present difficulties. E. S. P.

Worcester, Mass., 1851.

MR. EDITOR.—By experiment I have found that a saw with coarse teeth, filed with a three-cornered file, and the teeth made to project as much as possible, with the set as near to the point as can be without breaking, will cut with but a small part of the surface. If the teeth are straight and standing, the saw scrapes a great deal and does not cut as much; it will, therefore, vibrate, and this I believe to be the cause of heating. I have observed many, who were inexperienced, run their saws too fast. This causes too much friction, heats the points of the teeth, softens, and soon dulls them. When the saw is dull, and running at too high a speed, it will certainly vibrate and heat, and I have noticed that it commences to heat at the centre or edge of the collars. A 24-inch circular saw should never be allowed to run more than 600 revolutions per minute in hard seasoned wood. Yours truly, A. S., Me.

The Washington Monument.

A writer in the National Intelligencer, of the 5th inst., says:—The work on the monument has now attained to the height of one hundred and four feet from the surface of the ground, and, if it advances with the same rapidity as it has so far done, it will in a few years reach its apex at an elevation of five hundred and seventeen feet; forming the loftiest structure in the world; one that will do great honor to the American people, by whose voluntary contributions it has thus far been constructed; and these contributions will not cease to be made with the same spirit which has been shown from the commencement, till this magnificent and noble testimonial of their gratitude and veneration shall reach its destined height.

Kossuth and Paul.

We notice in the papers, that Henry Howard Paul, Editor of the American Magazine, in London, has written a letter to Kossuth, and received a reply,—so far so good. We now wish said Henry Howard Paul would write us a few letters, and thus cancel an obligation, a receipt for which he duly executed. Speaking of Kossuth reminds us that in some instances he may unconsciously fall into strange company.

Honor to an American Inventor.

Mr. Geo. Wright, the ingenious inventor of the beautiful machine for making percussion caps, which was exhibited at the capitol last year, and whom we saw as he was going away, has just returned from Constantinople, to which city he took one of his machines, to submit to the Ottoman Government. The Sultan not only ordered it to be purchased, but bestowed on the worthy inventor a complimentary present of much intrinsic value as well as beauty. It consists of what the Turks call a Zarf, or coffee cup holder, finely enamelled, and ornamented with some thirty diamonds. The Sultan of Turkey has always exhibited a warm side to American inventors, and this is another token of his good will.

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☞ Reported expressly for the Scientific American, from the Patent Office Records. Patentees will find it for their interest to have their inventions illustrated in the Scientific American, as it has by far a larger circulation than any other journal of its class in America, and is the only source to which the public are accustomed to refer for the latest improvements. No charge is made except for the execution of the engravings, which belong to the patentee after publication.

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING DECEMBER 9, 1851.

To A. S. Beadleston, of Au Sable Forks, N. Y., for improved Revolving Reverberatory Furnace.

I claim the rolling or revolving furnace, revolving on friction wheels or rollers, or their equivalent, in combination with an ordinary fire, such as is used in reverberatory furnaces, the two being combined in such a manner that the products of combustion, heated gases, etc., from the grate, shall pass into the interior of said rolling or revolving furnace, substantially as described, said rolling or revolving furnace, being applicable to any purpose for which ordinary reverberatory or wind furnaces are employed.

To D. D. Bell, of Wawarsing, N. Y., for improvement in Potato Diggers.

I claim the arrangement and combination of the cutting and digging cylinders with the riddles, in the manner set forth.

To Cornelius Bogart, of Charlestown, Mass., for improvement in construction of Sounding Boards for Musical Instruments.

I claim the described mode of constructing the sounding boards of stringed instruments, by combining or arranging together, any suitable number of pieces of wood, prepared as described, all in the manner and for the purpose set forth.

To Jn. C. fr. Saloman, of Cincinnati, O., for improved Carbonic Acid Engine.

I do not claim the invention of carbonic acid gas, in its liquified or aeriform character, as a motive power; neither do I claim the use of the hydrostatic press for liquifying the gas, as these principles have long been known and commented upon by Sir H. Davy, Faraday, Brunnel, and others; but what I claim is, first, a carbonic acid gas engine, in which said fluid passes from a reservoir, where it exists in a liquid state, through suitable valves, into a heated cylinder, thence into a refrigerator, where it is condensed by hydrostatic pressure, and forced back again to the reservoir before named, the said engine being constructed substantially as described.

Secondly, the combination of crimped leather washers, a spiral spring or springs, and oil, or any lubricant, for packing the piston rods or plungers, as described.

To J. S. Conant, of Lowell, Mass., for improvement in Gas Regulators.

I claim the closing of the valve when the fluid becomes too low in the gas regulator for safety, by the movement of the float, and the lever, and their action upon the thimble on the valve rod, substantially as set forth.

To John Ericsson, of New York City, for improvements in Water Metres.

I claim, first, the uniform circular channel, in combination with the contracted channel.

Second, I claim the rotating paddle wheel, having paddles projecting into and working in the said uniform and contracted channels.

Third, I claim the apertures (two) proportioned and formed as described.

Fourth, I claim the pipe with its jet for giving motion to the paddle wheel before the fluid enters through the aperture.

Fifth, I claim the valve, by which any desirable power of jet may be obtained before any fluid enters through the aperture.

To Jos. Hyde, of Troy, N. Y., (assignor to Thos. J. Eddy, of Waterford, N. Y., for improvement in Chucks for Lathes.

I claim the mechanism described, or the equivalent thereof, for connecting and disconnecting, at will, the whole or any part of the screws which operate the griping jaws, with the wheel which turns them, so that the screws and jaws may be moved either separately or in connection, or in part separate and in part connected, whereby objects of either regular or irregular shape, may be chucked, either eccentrically or concentrically, with the axis of the mandrel, substantially as described.

I also claim the turning plate of the chuck constructed with a cog-wheel on its inner face, made in segments, part of which can be withprawn out of gear with the pinions on the carrier screws, or held in gear therewith, by means of set screws and springs, or the equivalent thereof, substantially as set forth.

To Chas. Ketcham, of Penn Yan, N. Y., for improvement in Feeding Logs in Saw Mills.

I claim the combination of any number of adjustable rollers, which may be set at any angle with the feed rollers, or with each other, for the purpose of feeding up the logs, so that it may be cut with the curve or grain of the wood, substantially in the manner set forth and described.

To Saml. Porter, of Hartford, Ct., for improved arrangement of Pans for Washing Ores, Minerals, etc.

I do not claim the device of arranging a movable pan in a vibrating frame, and of operating the same, so as to give a double motion to the pan, since Letters Patent for this invention have been granted to Arnold Buffum and Philip Thorp. But I claim arranging and operating a series of ore washing pans, or sets of pans, in a vibrating frame, said pans or sets of pans, having also an oscillating or rocking motion in the frame, in such a manner that, as the superficial portion of the contents passes freely from any one pan or set of the series, into the next, the contents shall, at the same time, pass out of the latter less freely, or not at all, and vice versa, substantially as described.

Second, I claim also the arranging, in a vibrating frame, of a series of pans or sets of pans, one after the other, each pan or set being hung upon the frame by a separate axle, or equivalent attachment, and secured in its working position, by a catch, or other equivalent means, in such a manner, that each pan or set, may be conveniently disconnected and tilted, so as to discharge its whole contents into a receptacle separate from those of the other pans.

Third, I claim also the arranging of a succession of groups of pans, by a constant duplication, for the subdivision of the contents, in such a manner that the contents issuing from each pan of any one group, the last excepted, shall pass, by an equal division, into two pans of the next succeeding group, substantially as described.

To Ezra Ripley & E. L. Brundage, of Troy, N. Y., for improvement in Car Seats.

We claim the arrangement of the reversing arms pivoted midway the height of and to the back, so that they shall descend and slide through the pivot rollers, so that any required height of back may be reversed from one side of the seat to the other, in the manner and for the purpose substantially the same as described,

To G. W. Tolhurst, of Cleveland, O., for improvements in Lath Machines.

I claim so arranging the frame that carries the reciprocating or chopping knives and feeding apparatus, as that whilst cutting it shall at all times rest, by its own weight, on the bolt or log, in advance of the portion thereof which is being cut, in combination with the mode as described of giving to the knives carried in said frame, an alternating drawing movement towards and from the log, independent of the downward motion or position of the frame, by which means the block may be entirely reduced to laths, while the whole weight of the knife frame is resting on it, to keep it firm and solid.

I also claim, in combination with the cutter stock. the feeding plate, for feeding up the log to the cutters, a "throw" being given to said stock for that purpose, and this I claim, whether the same is accomplished by the means herein specially set forth, or by any other means essentially the same.

To T. A. Davies, of New York City, for improvement in Running Gear of Railroad Cars.

I claim adapting to each side of railroad car trucks, four or more wheels attached to a frame-work, inflexible vertically, but with a horizontal motion, in such a manner that in case of depressions in the rails at their joinings or otherwise, they (the wheels) will alternately, by couplets, triplets, or the like, receive the weight of the load above and relieve the wheel passing over the depression, from the weight of the load and frame-work, so that no concussive blow is struck with that weight or jar created, substantially as described.

DESIGNS.

To J. D. Green, of Troy, N.Y. (assignor to Backus, Bacon & Co., of Le Roy, N. Y.), for Design for Stoves.'

To Winslow Ames, of Nashua, N Y. (assignor to Hartshorn & Ames), for Design for Stoves.

Lichens.

Lichens are a family of plants, belonging to the class *cryptogamia*, containing about 1,400 known species, under several genera. Their substance is powdery, crustaceous, membraneous, coriaceous, or even corneous. They are common everywhere, adhering to rocks, trunks of trees, and barren soil. On ascending mountains, they are flourishing beyond the limit of all other plants even to the verge of the perpetual snow.—Many of them, fixing upon the hardest rocks, by retaining moisture, facilitate their decomposition and promote the formation of soil. Several of the species are used for sustenance in times of scarcity, by the inhabitants of the northern regions.

Iceland moss is exceedingly abundant in the arctic regions, and often affords aliment to the inhabitants, either in the form of gruel or bread, which last is very nutritious. The taste is bitter, astringent, and extremely mucilaginous. It is frequently employed in pharmacy, in the composition of various pectoral lozenges and syrups, and is celebrated as an article of diet, in combination with milk, in coughs and pulmonary affections.

Orchil (*rocella tinctoria*) is also an important article, though less now than formerly, on account of the fugitiveness of the rich purple and rose-colored dyes which it yields. Some of its tints, however, are capable of being fixed, and it is, besides, employed for staining marble, forming blue veins and spots. Several other lichens afford dyes of various colors, as litmus.

Lichen, Liverwort, or Algæ, are the stunted herbage of the arctic circle, and of barren heaths. In Iceland and Lapland, it is eaten in broths and milk, and even made into bread, its bitterness being removed by washing in hot waters. It contains much mucilage or gluten, and has been extensively used in pulmonary complaints, and as a demulcent, relieving cough, and correcting all acrid secretions.

Lichen, or Archil is famous for its dye of purple blue, violet, &c. It is mostly brought from the Canary Isles, and is there ground in a mill, mixed with pearl-ash and urine, and sold in cakes.

The dye of archil is very evanescent, but very beautiful. It produces the most beautiful purples on woolen and silk goods, by first dyeing the goods a cochineal red and then blueing them down in a warm bath of archel solution. Crimson silk receives its first preparation of archil before it is put into the mordaunt of the nitro-muriatic of tin which is the prior preparation for a bath of ground cochineal. Many beautiful light purple silk ribbons are indebted to this simple plant for their glowing colors; very few who wear them are aware of the substances employed to add grace to their dress and ornament to their persons.

A Worthy Migrating Printing Press.

The Columbia Star, a newspaper just established at Columbia, Cal., is printed upon the old Ramage Press, which was used to start the Alta California and many other papers in the El Dorado. The Sonora Herald giving the history of this press, says:—

"In what year this press was built, or how it was used prior to its embarkation from New York, tradition doth not inform us; but its career of emigration commenced by a trip from New York to Texas. From thence it travelled through Mexico; thence to Monterey, in California, where it was used by the Governors for printing proclamations and other public documents. Thence it removed to San Francisco, for the introduction of her first newspaper—we forget its name—the one, however, which has grown into The Alta California. Anxious to disseminate further light, it afterwards moved to Sacramento, and lo! The Placer Times began to be scattered among a reading people. Its missionary work being performed in that city it planted its next station at Stockton and gave us The Times, the first paper published in the San Joaquin district. About the first of July, 1850, The Sonora Herald appeared, proud to hail from the same old press, that had never yet been broken. On that and no other we have continued to print, until a few weeks since, when it surrendered its place to a large Washington press. Still a missionary, it goes to Columbia, and The Star will be the fifth journal, in this State, that has been started by it. The others are all in a flourishing condition, and we hope The Columbia Star will succeed in like manner."

Wool in the United States.

It is estimated that 71,000,000 pounds of wool are annually consumed in the United States, and that although the profits of raising wool are about 18 per cent. yet there is not enough raised to supply the demand, consequently much has to be imported. It is believed by those who are well able to judge of the matter, that the United States can not only raise enough of wool to supply all our own wants, but raise it cheap enough to supply other nations, instead of importing it from them. We learn By the Philadelphia Ledger, that Mr. P. A. Brown, of that city, who has devoted so much attention to the examination of wool, is about to visit Washington City with a view of bringing the result of his interesting investigations to the notice of Congress. Mr. B. has examined many hundreds of specimens of wool raised in Europe and the United States, and has compared those produced in this country with the best of foreign growth. The result of his investigations is, that wool may be raised in this country, and particularly in Pennsylvania, New York, and Virginia, equal to the best imported wool. Mr. B.'s conclusions are based upon accurate experiments, testing the fineness, ductility, elasticity, and strength of the wools of Saxony with those of this country, which he was enabled to do by the kindness of the King of Saxony, who sent him a very large number of samples of the best kinds raised in that country. Mr. B. contends that all that is necessary to the production of the finest quality of wool is to keep distinct species of the sheep separate—to allow no crossing of breeds out of the species. One species produces wool in the highest perfection, another produces hair.

New Building Material in California.

A material is to be found in the vicinity of Benicia, which will doubtless be extensively used for building purposes. Several houses have already been constructed of it, and the pliability with which it can be worked, the ease with which it can be transported to market, it durability, and its power of resistance against fire, will doubtless render it very popular as a material to be used in the construction of houses. It is a kind of sand stone, and can be wrought into different shapes more easily than oak. By subsequent exposure to the weather it becomes exceedingly hard. Pieces have been tested by fire, and are pronounced to have been little if any effected by it. Its color is light brown, and when properly worked with the hammer it gives to a building an exceedingly ornamental appearance. Those who have used it, state that a house can be built of it more cheaply than it can of bricks.

The Way to Examine a Railroad.

The Rev. Thomas Whittemore, of Cambridge, the President of the Vermout and Massachusetts Railroad, has recently accomplished a walk over its entire length, from Fitchburg, Mass., to Brattleborough, Vt., a distance of seventy miles. In going over the route, Mr. Whittemore made it a point to travel on the sleepers, in order somewhat to test their firmness; he also aimed in this novel excursion to examine various sections of the road, for various purposes, to investigate in person the gates, crossings, the construction of culverts, the bridges over which the cars pass, the way stations, &c. To do all this he chose to go on foot. The exact amount of time consumed in perform the self-imposed duty, we are not informed.

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TO CORRESPONDENTS.

W. P., of Mass.—Youask "how many *square* inches of water it takes to grind 7 bushels of corn with 4 feet stone and 5 feet fall:"—we cannot tell, for *square* inches of water have no power; but it takes about 122 cubic inches with a 5 feet fall, 5 feet wheel, to grind 7 bushels of wheat per hour, but it is perfectly possible for one wheel to consume twice as much water as another: the only way to arrive at right conclusions on this point, is, by the experience of several millwrights and millers, and yet, although we have some works by practical millers, we cannot say that there is one quite definite for us; it would appear as if there was something in their own business a little in the dark to them.

S. F. Beck, of Ct.—Your bound volume of the Scientific American was sent to your address, at Danbury, by express, several weeks ago.

J. W., of Pa.—We do not see any patentable novelty in your arrangement for supplying water to a steam boiler; the same plan has been weil known to us for years.

P. L. S., of Miss.—We have carefully examined the sketches of your improved machinery for making picket fences, and think it new and worthy of a patent: we do not think it infringes any other: should you conclude to make an application, a small model would be required, say about a foot square.

M, K., of Mass.—Your plan for propelling a boat is not new; the same plan has been known to us for a number of years: it is illustrated in Vol. 45 London Mechanics' Magazine: we saw a boat propelled on the same principle, in this city, in 1848; it proved an entire failure.

J. S., of Ohio—It would have given us pleasure to have published your letter, but the same plan, so far as it relates to the form, has been proposed before; the invention required is a new propelling power of great force in a small space.

N———, of Wis.—Your new plan of lathing we like, it is a good one, but is it not more expensive than the old plan? if not, it ought to be generally adopted.

F. S. S., of Conn. Prof. Page, uses Grove's Battery—no other; there has been but one connection to unite the zinc and copper plates.

A. A., of Md.—We have never seen a pump in operation exactly like yours, but we like the old "lifting" pump better; it can draw water from any depth; You will find an engraving of a pump in No. 1, Vol. 3, Sci. Am., the same in principle as that suggested by your friend; it is the invention of a Maryland gentleman.

E. D., of N. O.—Bellows pumps are very old; you will find them fully described in Ewbank's Hydraulics.

J. B. C., of Tenn.—We will give yours attention next week.

F. V., of Mich.—We do not think there can be any doubt of the fact that a patent can be obtained for your invention. It must certainly be useful if made to operate as you anticipate: our fee for making such an examination as you speak of will be $5.

R. E., of Mass.—We cannot understand your invention, as the description is vague and indefinite; either send us a drawing described or a model, and then we will attend to your wants.

U. L. A. E., of Ga.—There is no work published in this country of the character you desire, which we could recommend.

J. K., of N. Y.—The best way for you to bring your invention before the public, is to get an engraving of it in the Scientific American.

A. H. P., of N. B.—Provincial post-office stamps would be of no use to us; we have some Canada stamps already on hand which we should like to dispose of at 50 per cent discount.

Money received on account of Patent Office business for the week ending December 13.

N. A., of Ct., $20; M P., of L. I., $32; J. H. C., of Ohio, $20; J. W. & Co., of Mass., $30: G. J. W., of Me., $30; B. D. S., of Va., $67; L. J., of Mass., $55; W. McC., of N. Y., $20; P. D., of Pa., $30; W. H. H., of N. J., $10; J. A. & G. C., of N. Y., $30; A. L., of N. Y., $27; S. H., of N. J., $30.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Dec. 13:—

J. H. C., of Ohio; J. W. & Co., of Mass.; N. A., of Ct.; A L., of N. Y.; G. J. W., of Me.; M. P., of L. I.; S. H., of E. J.; W. H. H., of N. J.; W. McC., of N. Y.; L. J., of Mass.; J. A. & G. C., of N. Y.

An Important Paragraph.

Subscribers names, as they now come in, will be entered to commence with No. 14, the first number on the second quarter, unless the back numbers are expressly ordered.

Whenever our friends order numbers they have missed—we always send them if we have them on hand. We make this statement to save time and trouble, to which we are subjected in replying when the numbers called for cannot be supplied.

Sending Receipts.---Postage on Books.

The Post Office Laws do not allow publishers to enclose receipts; when the paper comes regular subscribers may consider their money as received.

Subscribers ordering books or pamphlets are particularly requested to remit sufficient to pay postage.

Back Numbers and Volumes.

In reply to many interrogatories as to what back numbers and volumes of the Scientific American can be furnished, we make the following statement:

Of Volumes 1, 2 and 3—none.

Of Volume 4, about 20 Nos.; price 50 cts.

Of Volume 5, all; price, in sheets, $2; bound, $2,75.

Of Volume 6, all price in sheets, $2; bound, $2,75.

ADVERTISEMENTS.

Terms of Advertising.

One square of 8 lines, 50 cents for each insertion.
" 12 lines, 75 cts., " "
" 16 lines, $1,00 " "

Advertisements should not exceed 16 lines, and cuts cannot be inserted in connection with them at any price.

American and Foreign Patent Agency

IMPORTANT TO INVENTORS.---The undersigned having for several years been extensively engaged in procuring Letters Patent for new mechanical and chemical inventions, offer their services to inventors upon the most reasonable terms. All business entrusted to their charge is strictly confidential. Private consultations are held with inventors at their office from 9 A. M., until 4 P. M. Inventors, however, need not incur the expense of attending in person, as the preliminaries can all be arranged by letter. Models can be sent with safety by express or any other convenient medium. They should not be over 1 foot square in size, if possible.

Having Agents located in the chief cities of Europe, our facilities for obtaining Foreign Patents are unequalled. This branch of our business receives the especial attention of one of the members of the firm, who is prepared to advise with inventors and manufacturers at all times, relating to Foreign Patents.

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EXCELSIOR SAND AND EMERY PAPERS are offered as new and superior articles; the paper is made from the best Manilla hemp, and consequently is very strong and lasting; the grit is of the sharpest and most enduring kind, and being manufactured by an improved process, is firmly attached to the paper with a remarkable evenness of surface; their freeness from ridges, stripes, and other imperfections, recommend them to the notice of consumers. These papers have been used by many of our first mechanics, and are pronounced superior to all others. Every sheet is stamped Blanchard & Parsons, and warranted. Samples furnished at the office, No. 187 Water street (2nd story), New York.
14 6m* BLANCHARD & PARSONS.

CLOVER SEPARATOR.—Any person having a good Clover Separator machine, with a shaking apparatus attached, may hear of a customer by addressing J. W. RICHARDS, 44 Ann street, N.Y. Persons who have a knowledge of where such a machine may be obtained, will oblige the advertiser by addressing as above. 1*

CHAS. W. COPELAND, Consulting and Mechanical Engineer, Surveyor of Steam Machinery, &c., No. 68 Broadway, N. Y.—Superintends the construction of steam vessels, and steam engines and machinery of every description; specifications and contracts prepared; also, general plans and drawings in detail furnished. Steam engines surveyed and valued, and condition reported. Mr. C. also acts as agent for the purchase and sale of steam vessels, steam engines, boilers, &c. 14 4*

SECOND-HAND MACHINERY.---One Screw Cutting Machine, in complete order, with counter shaft and belting, nearly new. One portable Engine and Boiler, 4 horse-power, entirely new; 12 hair Looms, improved pattern with cast-iron frames in good order. One 20 horse Beam Engine in complete order. Second-hand pullies. hangers, shafting, belting, &c. Also one 20 inch india rubber belt 175 feet long, very little used. For sale very low by
13 2* WM. D. ANDREWS, 187 Cherry st., N. Y.

TO BLACKSMITHS AND SPRING MAKERS.—The undersigned has an application for a patent now pending at the U. S. Patent Office for an improved Elliptic Spring Joint. Its expense is only one-fourth as much as that of those in common use. Upon the receipt of one dollar, a fine descriptive engraving of this joint with directions for constructing the same, will be sent to any person so remitting, and also one individual right to make, use, and vend the same, as soon as the patent is issued. This is no untried invention; it has been tested with perfect success, and reliable certificates from those who have used this joint, will be given on application, post-paid, to S. S. BARRY, Brownhelm, Lorain Co., Ohio. 13 3*

P. W. GATES'S PATENT DIES FOR CUTTING SCREWS—Patented May 8th, 1847.—This Die cuts Screws of any size, V or square thread, by once passing over the Iron. Also, Lead Screws for Lathes, Hoisting Screws, &c. All orders for Dies and Taps, with or without machines, will meet with prompt attention by addressing P. W. Gates, or Gates & McKnight, Chicago; Marshall, Bement & Colby, Philadelphia; Woodburn, Light & Co., Worcester, Mass. References—All the principal machine shops in New York, Philadelphia, and Boston. 13 6m*

LATHES FOR BROOM HANDLES, Etc.—We continue to sell Alcott's Concentric Lathe, which is adapted to turning Windsor Chair Legs, Pillars, Rods and Rounds; Hoe Handles, Fork Handles and Broom Handles.

This Lathe is capable of turning under two inches diameter with only the trouble of changing the dies and pattern to the size required. It will turn smooth over swells or depressions of 3-4 to the inch and work as smoothly as on a straight line—and does excellent work. Sold without frames for the low price of $25—boxed and shipped with directions for setting up. Address (post.paid) MUNN & CO.
At this Office.

BILLINGS PATENT BAND WRENCH, for Wagons and Carriages.—This article is fully described and illustrated by engravings in No. 7, Vol. 7. of the Scientific American. The Patent Band Wrench applies to wagons and carriages where the common or square nut is used. They are perfectly tight and prevent all dust and dirt from reaching the axle. The wheel is taken off by means of a small pocket key. A Silver Medal was awarded this article by the American Institute at their late Fair in this city. The Bands are manufactured by the Patent Band Wrench Co., located at Claremont, N. H. Smith Van Horn & Co. are the agents for this city. Orders addressed to them, as above, will meet with prompt attention. A. M. BILLINGS,
12tf General Agent for the Co.

ENGELBRECHT & HOOVER, No. 257 Broadway, (Opposite the Park), New York, in the business of a general Patent Agency, and matters connected with the purchase and sale of inventions and patents. At the above establishment any acknowledge good invention, or Letters Patent, can be purchase or sold for any portion of the United States or Europe. 12 4*
DR. T. F. ENGELBRECHT, T. D. HOOVER.

TRAUTWINE ON RAILROAD CURVES.—By John C. Trautwine, Civil Engineer, Philadelphia; just published and for sale by WM HAMILTON, Actuary of the Franklin Institute Price $1.

"This is a really good work, and we heartily recommend it to our civil engineers."—[Scientific Am.

"We have carefully examined this work, and regard it as the best that has yet appeared on the subject," &c.—[Am. Railroad Jour. 8 10*

POST'S PATENT SLIDING DOOR FRONTS—For Stores and Public Buildings; a new, cheap, and simple fixture for securing store fronts, which renders them fire and burglar proof, has been invented and patented by the subscriber, who is now prepared to sell rights. Messrs. Quarterman & Son, 114 John st., N. Y., are general agents. Address (post paid) Wm. POST, Architect, Flushing, L. I. 6 3m

TILTON's Patent Violin.—The undersigned having patented his Violin Improvement, is prepared to exhibit it to the public. Being now in New York, he may be found at No. 18 Park Place (Mr. J. Wiley's), where he will be pleased to see such gentlemen as take an interest in his invention. All communications addressed "Wm. B. Tilton & Co.," as above, or at Carrolton, Pickens Co., Ala.
3 12* WM. B. TILTON.

PROFESSOR ALEX. C. BARRY'S TRICOPHEROUS OR MEDICATED COMPOUND.—Professor Barry does not hesitate to put his Tricopherous, for the two grand requisites of efficacy and cheapness, against any preparation for cleansing, renewing, preserving, and strengthening the Hair, that has ever been advertised or offered for sale. He challenges the associated skill and science of the medical world to produce, at any price, an embrocation that will reduce external irritation, cure ordinary cutaneous diseases and severe cuts, sprains, pains, &c. Sold in large bottles, price 25 cents, at the principal office, 137 Broadway, New York, and by the principal merchants and druggists throughout the United States, Canada, Mexico, West Indies, Great Britain, France, &c. 4 12*

CLOCKS FOR CHURCHES, PUBLIC BUILDINGS, RAILROAD STATIONS, &c., and REGULATORS FOR JEWELLERS.—The undersigned having succeeded in counteracting effectually the influence of the changes of the temperature upon the pendulum, and introduced other important improvements in the construction of clocks, are prepared to furnish an article, superior in every respect (the highest grade warranted to vary less than two minutes in a year) to any made in the United States. Ample opportunity will be afforded to test their qualities. Glass (illuminated) dials of the most beautiful description furnished. Address SHERRY & BYRAM, Oakland Works, Sag Harbor, Long Island, N. Y.

"At the Oakland Works of Sherry & Byram there are made some of the finest clocks in the world."—[Scientific American.

"Mr. Byram is a rare mechanical genius."—[Jour. of Commerce. 5 10

PATENT CAR AXLE LATHE—I am now manufacturing, and have for sale, the above lathes; weight, 5,500 pounds, price $600. I will furnish a man with each lathe, who will turn and finish axles for 50 cents each, if desired. I have also for sale my patent engine screw lathe, for turning and chucking tapers, cutting screws and all kinds of common job work, weight 1500 lbs., price $225. The above lathe warranted to give good satisfaction. J. D. WHITE, Hartford, Ct. 7 6m*

A CARD.—The undersigned begs leave to draw the attention of architects, engineers, machinists, opticians, watchmakers, jewellers and manufactures of all kinds of instruments, to his new and extensive assortment of fine English (Stubs) and Swiss Files and Tools; also his imported and own manufactured Mathematical Drawing Instruments of Swiss and English style—which he offers at very reasonable prices. Orders for any kind of instruments will be promptly executed by F. A. SIBENMANN Importer of Watchmakers' and Jewellers' Files and Tools and manufacturer of Mathematical Instruments 154 Fulton st. 6 9*

THE SUBSCRIBER has on hand several improved Steam Engines of superior quality, and made of the best materials, particularly adapted to manufacturing, saw mills, flour mills, &c. He will also make to order, at the shortest notice, engines and boilers of from 2 to 50 horse power, with all their appendages; prices reduced. Also, shafting, mill gearing, saw mills, presses, drills, &c. He has also facilities for furnishing lathes, planes, and scroll chucks, of the most approved styles and patterns, at short notice. Chain pumps always on hand, wholesale and retail, at No. 4 Howard st., New Haven, Ct.
10 7* AARON KILBORN.

1851 TO 1856.----WOODWORTH'S PATENT Planing Machines.—Ninety-nine hundredths of all the planed lumber used in our large cities and towns continues to be dressed with Woodworth's Machine. Price of the machine from $150 to $760. For rights in the unoccupied towns and counties of New York and Northern Pennsylvania, apply to JOHN GIBSON, Planing Mills, Albany, N. Y.
9 10*

LOGAN VAIL & CO., No. 9 Gold street, New York, agents for George Vail & Co., Speedwell Iron Works, have constantly on hand Saw Mill and Grist Mill Irons, Press Screws, Bogardus' Horse-Powers, and will take orders of Machinery of any kind, of iron and brass; Portable Saw-mills and Steam Engines, Saw Gummers of approved and cheap kind, &c. Gearing, Shafting, large and small, cast or of wrought iron. 11tf

THE SATURDAY EVENING POST, THE Leading Literary Weekly in the Union.—The proprietors think it unnecessary to dwell upon the distinguishing features of the "Post," whose brilliant success, during an existence of thirty years, is a sure guarantee of the future. For the coming year we have made arrangements for the following nouvelletts:—"Eoline, or Magnolia Vale," by Mrs. Caroline Lee Hentz, author of Linda, Rena, &c.; "Trial and Triumph," by T. S. Arthur, author of The Iron Hand, Temperance Tales, &c. &c., &c. The "Post" will also contain, weekly, choice selections, news, bank note list, state of markets, &c. Terms—Single copy, $2 per year, or three years for $5, in advance. Clubs (to be sent to one P. O.), 4 copies, $5; 9 copies, $10; 14 copies, $15; 21 copies, $20, in advance. Address always post-paid. DEACON & PETERSON, 66 south 3rd st., Philadelphia. A copy of the "Post" will be sent as a specimen to any one. 10 5

BALLOONS.—I am prepared to manufacture Hydrogen Balloons of from 1 pound to 50,000 lbs. ascending power to order. Balloons capable of carrying up one or two persons always on hand. The Balloons will be of the most perfect construction, so that any person can, with certainty and safety ascend with them. Instructions to insure success given to purchasers gratis. JOHN WISE, Lancaster, Pa. 9 10*

SCRANTON & PARSHLEY, Tool Builders, New Haven, Conn., have on hand six 12 ft. slide lathes, 28 in. swing; also four 8 ft. do.; 21 in. swing, with back and screw gearing, with all the fixtures; one 5 ft. power planer; 12 drill presses, 4 bolt cutting machines, 30 small slide rests; 5 back geared hand lathes, 21 in. swing; 15 do. not geared; 8 do. 17 in. swing on shears 5 1-2 feet; 25 ditto with and without shears, 13 in. swing; counter shafts, all hung if wanted suitable to the lathes. Scroll chucks on hand; also index plates for gear cutting. Cuts of the above can be had by addressing as above, post-paid. 9tf

BEARDSLEE'S PATENT PLANING MAchine, for Planing, Tonguing and Grooving Boards and Plank.—This recently patented machine is now in successful operation at the Machine shop and Foundry of Messrs. F. & T. Townsend, Albany N. Y.; where it can be seen. It produces work superior to any mode of planing before known. The number of plank or boards fed into it is the only limit to the amount it will plane. For rights to this machine apply to the patentee at the abovenamed foundry—or at his residence No. 764 Broadway; Albany. GEO. W. BEARDSLEE. 5tf

WATTS & BELCHER, Manufacturers of Steam Engines, Lathes, Planing Machines, Power Presses, and Mechanics' Tools of all descriptions. Orders respectfully solicited and punctually attended to. Washington Factory, Newark, N. J. 7 20*

PAINTS, &c. &c.—American Atomic Drier, Graining Colors, Anti-friction Paste, Gold Size, Zinc Drier, and Stove Polish.
QUARTERMAN & SON, 114 John st.,
9tf Painters and Chemists.

MACHINERY.—S. C. HILLS, No. 12 Platt-st. N. Y. dealer in Steam Engines, Boilers, Iron Planers, Lathes, Universal Chucks, Drills; Kase's, Von Schmidt's and other Pumps; Johnson's Shingle Machines; Woodworth's, Daniel's and Law's Planing machines; Dick's Presses, Punches and Shears; Morticing and Tennoning machines; Belting; machinery Beal's patent Cob and Corn mills; Burr mill and Grindstones; Lead and Iron Pipe &c. Letters to be noticed must be post-paid. 1tf

LAP-WELDED WROUGHT IRON TUBES for Tubular Boilers—from 1 1-4 to 7 inches in diameter. The only Tubes of the same quality and manufacture as those so extensively used in England Scotland, France and Germany—for Locomotive Marine and other steam Engine Boilers.
THOS. PROSSER & SON, Patentees,
1tf 28 Platt-st. N. Y.

MALLEABLE IRON FOUNDRY, EASTON, Mass.—The subscriber continues to manufacture castings of every variety, for machinery and other purposes, of the best quality, at the above establishment, we have facilities for making castings 5 1-2 feet in length. Persons wishing castings can send patterns to Easton Express, Boston, Mass. All letters will be promptly attended to.
8 10* DANIEL BELCHER.

WOOD'S IMPROVED SHINGLE MACHINE—Patented January 8th 1850, is without doubt the most valuable improvement ever made in this branch of labor-saving machinery. It has been thoroughly tested upon all kinds of timber and so great was the favor with which this machine was held at the last Fair of the American Institute that an unbought premium was awarded to it in preference to any other on exhibition. Persons wishing for rights can address (post-paid) JAMES D. JOHNSON, New Haven, Ct.; or WM. WOOD, Westport; Ct., All letters will be promptly attended to. 37tf

LEONARD'S MACHINERY DEPOT, 109 Pearl-st. 60 Beaver N. Y.—The subscriber is constantly receiving and offers for sale a great variety of articles connected with the mechanical and manufacturing interest, viz.: Machinists' Tools—engines and hand lathes; iron planing and vertical drilling machines; cutting engines, slotting machines; bolt cutters; slide rests; universal chucks &c. Carpenters' Tools—mortising and tennoning machines; wood planing machines &c. Steam Engines and Boilers from 5 to 100 horse power. Mill Gearing—wrought iron shafting; brass and iron castings made to order. Cotton and Woolen machinery furnished from the best makers. Cotton Gins; hand and power presses. Leather Banding of all widths made in a superior manner; manufacturers' Findings of every description. P. A. LEONARD. 10tf

MANUFACTURE OF PATENT WIRE Ropes and Cables—for inclined planes, suspension bridges, standing rigging, mines, cranes, derick, tillers &c.; by JOHN A. ROEBLING; Civil Engineer—Trenton N. J. 47 1y*

RAILROAD CAR MANUFACTORY—TRACY & FALES, Grove Works, Hartford, Conn. Passage, Freight and all other descriptions of railroad Cars, as well as Locomotive Tenders, made to order promptly. The above is the largest Car Factory in the Union. In quality of material and in workmanship, beauty, and good taste, as well as strength and durability, we are determined our work shall not be surpassed. JOHN R. TRACY,
39tf. THOMAS J. FALES.

BEST CAST STEEL AXLES AND TYRES, (a new article,) for Railroad Carriages and Locomotives. The quality of this steel is sufficiently attested in the announcement that it has carried off the first prizes awarded at the World's competition of 1851, in London. The axles are in general use on the Continent, and are now offered in competition with any other that can be produced; and to be tested in any way that may be desired by the engineers of the United States, either by impact or by torsion. This steel is manufactured by Fried Krupp, Esq., of Essen, in Rhenish Prussia, represented in the United States by THOS. PROSSER & SON, 28 Platt st., N. Y.
2tf.

IRON FOUNDERS MATERIALS—viz.: fine ground and Bolted Sea Coal; Charcoal, Lehigh, Soapstone and Black Lead Facing. Iron and brass moulding sand; Fire Clay, Fire sand and Kaolin;—also English, Scotch and Welsh Fire Bricks—plain arch, circular and tower cupola—for sale by G. O. ROBERTSON Liberty place, between 57 and 59 Liberty-st. (near the Post Office) N. Y. 7 12*

McCORMICK'S PATENT REAPERS AND MOWERS.—1700 of these machines, for which the great Medal of the World's Fair was awarded, are being manufactured at Chicago, Ill, with the intention of supplying the South-eastern States for the next harvest The gold medal of the Chicago Institute was recently awarded for this Reaper and Mower, tested against two other mowers, in cutting prairie grass; and the first premium of the State Agricultural Societies of Wisconsin, Michigan and Pennsylvania, were also awarded at their late Fairs. Price $120 at Chicago, and $122 delivered at Philadelphia; terms otherwise accommodating. 9tf

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SCIENTIFIC MUSEUM.

Explosion of Andirons.

Several months since, says the Columbus (Ga.) Sentinel, the family of the editor was alarmed by a sudden and tremendous explosion, about ten o'clock at night, in an adjoining room. Upon enquiry it was ascertained that the hollow brass knob on the top of a common andiron had exploded throwing a fragment of it with great force into the ceiling. The report was louder than that of a pistol, and the knob was thrown with sufficient power to have killed a man. The circumstance was attributed to the sudden expansion of the air confined within the knob, but as such an occurrence had never been known before, the explanation was regarded as unsatisfactory. No mention was made of it. The recurrence of two similar accidents in this city within the last week, has induced us to mention the fact, as a caution to housekeepers and others, against the use of andirons of this description. We have known now of three different explosions under exactly similar circumstances—all of them fortunately harmless, but in each case the fragment of the knob was thrown off with force enough to have killed or seriously wounded any one whom it might have struck. We would advise against the use of andirons of this description; or if they are used, the knob should have a hole drilled in it of sufficient size to admit the free escape of any air that it may contain.

Warner's Pen.

Dr. Warner, some years ago, happened to be in the shop of an eminent stationer in the Strand, London, when a member of the House of Commons purchased a hundred quills for six shillings; when he was gone, the doctor exclaimed, "Oh, the luxury of the age! Six shillings for a hundred quills; why it never cost me six-pence for quills in my life."—"That is very surprising, doctor," observed the stationer "as your works are very voluminous." "I declare," replied the doctor, "I wrote my Ecclesiastical History, two volumes in folio, and my Dissertation on the Book of Common Prayer, a large folio, both the first and corrected copies, with one single pen. It was an old one when I began, and it is not worn out now that I have finished." This relation was spread about, and the merit of this pen was esteemed so highly, that a celebrated countess begged the doctor to make her a present of it; he did so; and her ladyship had a gold case made, with a short history of the pen written upon it, and placed it in her cabinet of curiosities.

If gold pens had been known in the Doctor's day, the wonder about his pen would cease, but that a grey goose quill could perform so much, is something more than extraordinary; it must have renewed its youth several times during the progress of the Doctor's Ecclesiastical History.

For the Scientific American.

Testing the Heat of Artesian Wells.

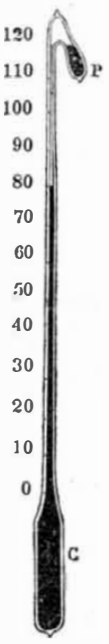
In addition to your article on the Artesian Well of Paris, I will give you a description of the instrument used by MM. Arago and Wulferdine, to ascertain the temperature of the water at the bottom of the well.

If a common thermometer were sent down the bore, the mercury would rise gradually, and be at its maximum at the bottom of the well, but when it would be raised up the column of mercury would sink gradually, and when taken out would show only the temperature of the upper part of the bore.

To ascertain with accuracy the exact degree of heat at the bottom, an instrument has been used, called "*Thermometer a Maxima*," from Latin words meaning at the highest,—that is, a thermometer indicating the highest degree to which it has been exposed.

Suppose an ordinary thermometer, with a cylindric reservoir, C, its upper part shaped so as to form a kind of side pocket, P, and the extremity of the tube is drawn to a very fine point opening into the said pocket, consequently all the mercury coming out of the point will fall into the pocket. The divisions of the tube are such that 10, 20, or more, are equivalent to one degree of an ordinary thermometer, and consequently one of those divisions will be one-tenth or one-twentieth of one degree.

Now, suppose such a thermometer sent down the bore of an artesian well, the heat increasing as it goes down, the mercury will expand by dilation, and will drop out in the pocket. When arrived at the bottom, where heat is to its maximum, the dilation ceases, and the tube is full to the point; then, after leaving it there some time, it is pulled up, and in its ascent the mercury passing through the bore cools gradually, contracts, and sinks in the tube down to a certain degree—let it be to 80; now it is evident that if you put this thermometer in warm water, and increase slowly the temperature until the mercury dilates up to the point, this water will have the same degree of heat as the bottom of the well where the mercury had raised to the same point; and if then you plunge in this water a good thermometer, it will indicate a number of degrees of heat equal to that of the bottom of



the well: suppose it to be 78 deg. Fahr.; but when out of the bore the mercury was down to 80 deg.; the whole tube being divided into 120 deg., it is then 20 deg. below the point, and if 10 of these are equal to 1 degree of the ordinary thermometer, the 20 deg. will be equal to 4 deg., which must be added to the 78 deg. found, and then 82 deg. will be the heat of the water at the bottom of the well.

To bring the instrument to its former state, so as to make a new experiment, it must be heated until the mercury is up to the point, and then keep it in an inclined position; when it cools, the mercury which was in the side pocket recedes into the tube, and the instrument is ready. This experiment should be repeated three or four times, and the average would be the exact degree of heat.

The tube, being made of glass might be broken by the pressure of the column of water in a deep well,—the one used had been enclosed in another thick glass tube sealed by the blow pipe, and was then protected against the pressure, taking care to keep it long enough in the bore so as to give time to the mercury to rise to the same temperature as the surrounding water.

Experiments repeated under many circumstances, prove that the internal heat of the earth increases to 1 degree centigrade for every 32 metres of depth. 32 metres are equal to 105 feet; 1 degree Fahr. is equal to 0·56 deg. centigrade,—it would be an increase of 1 degree Fahr. for every 59 feet.

The water coming out of the bore was 27 deg. 67 min. centigrade, or about 82 deg. Fahr.

E. Bonnett.

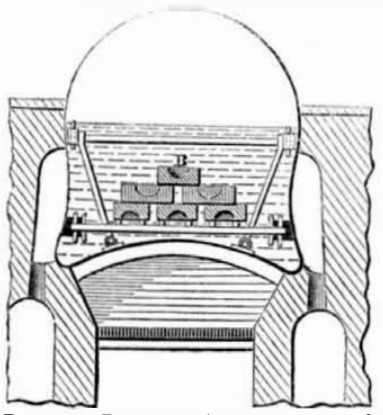
A Black Eye.

Whenever you get a black eye by a fall on the ice, or from running against the bedpost, apply the cloth wrung out of very warm water, and renew it until the pain ceases. The moisture and heat liquifies the blood, and sends it back to the proper channels. Use warm or hot, but never cold water to the bruise.

A letter from Palermo, of the 2nd ult., states that the Neapolitan Government intends to increase the export duties on sulphur and oil. This will assuredly create a war with England—a like result was about taking place ten years ago.

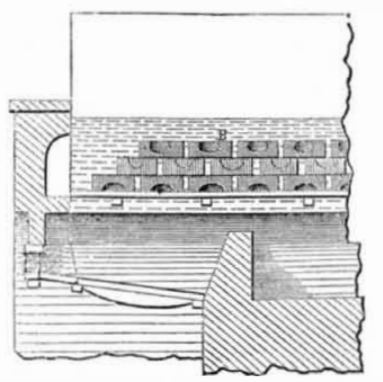
On Boilers.---No. 4.

Fig. 7.



Blocks in Boilers.—Armstrong states that in no case should there be more than 13½ cubic feet of water or half a cubic yard for each horse power,—and that lowering the quantity of water in the boiler, independent of increasing the steam room proved this; he undertook a long course of experiments in partially filling up the water spaces of boilers with large stones and other articles without altering the water level or other conditions of the boiler, somewhat similar to that which is represented in figs. 7, 8, and 9, to the extent in some cases, of leaving only a mere shell of water between the solid filling up blocks and the boiler sides; and it was invariably found that decreasing the water decreased the consumption of fuel. Even as much as from 5 to 10 per cent was occasionally gained in this way. Nothing can be more simple and cheap, literally costing nothing; for anything may be used for the purpose, such as iron, stone, timber, &c. The articles used should be fixed upon a platform made of iron rods, laid across the internal stays of the boiler, and sufficiently clear from bottom and sides as represented in the annexed figures. The most convenient articles for the purpose were large fire-bricks, B, from 18 to 20 inches long, 12 inches broad, and from 4 to 6 inches thick, with an oval-shaped concavity on one or both sides,

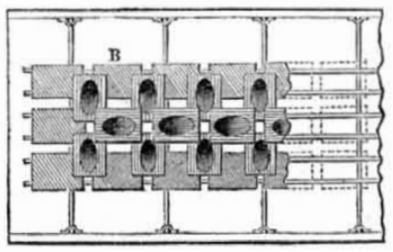
Fig. 8.



sufficient to take away about one half of the material. With these dimensions, 36 of them occupy about a cubic yard.

It is proper to mention one practical disadvantage in using the fire-brick blocks to any great extent. They were found to keep the steam up for some time after the fire was put out; a fact decisive of their economy in a theoretical point of view, yet, owing to the waste of water caused by the steam blowing away at the safety valve during the night, or after the engine had stopped, there was danger of its getting too low.

Fig. 9.



There can be little doubt that these filling-up blocks have a beneficial effect in producing a uniformity in the evaporation, independently of the effect arising from the displacement of the water, and which may be likened to that of the fly-wheel on the engine, by becoming a sort of reservoir of heat, or regulator of the evaporating power of the boiler. This effect is especially observable if compared to the irregular action of the boiler with a large inside flue when fired by hand, the steam being liable to vary very considerably every time the furnace door is opened.

The plan which most readily suggests itself for diminishing the quantity of water in land boilers, without diminishing its depth or lowering the water level, is that of one or more flue tubes through the lower part of the boiler. It is the most usual course recommended by the boiler makers; and when not too expensive, is certainly the best, as it both adds to the heating surface and strengthens the boiler at the same time, the tubes being made to answer all the purposes of stays. When the boiler is too short in proportion to its diameter, it may also be serviceable, if required, in causing the current of flame and smoke to continue longer in contact with the boiler.

Immense beds of Cannel coal have been discovered on Mahoning Creek, Armstrong Co., Pa. It is probably the outcrop of the bed of that mineral which is found on the Little Beaver.

LITERARY NOTICES.

Practical Metal Worker's Assistant.—This is a work edited by Oliver Byrne, C. E., and published by Henry Carey Baird, of Philadelphia; it is a large work of 460 pages printed on excellent paper, and contains more than 500 engravings. It treats of Forging Steel and Iron; Tempering Steel; Alloys; Works in Sheet Metal; Soldering; Punching; Electrotyping, etc. The work is mostly a collection of foreign authors; but these are very excellent, especially Holtzaffel. In connection with this, let us mark one point. On page 30 it states that the most popular accounts of papers on iron and steel are given in "Oliver Byrne's Dictionary," published by Appleton, New York. In the last number of Appleton's Magazine, Mr. Adams takes occasion to say that the said Dictionary was edited by him from letter F. In all the works that we have read on the manipulation of iron manufacture, to the practical worker there is much that is obscure and defective, but this new work is certainly the most elaborate and particular.

Dictionary of Musical Terms—By John S. Adams: Latin, Greek, Hebrew, Italian, French, German, Spanish, and English:—to which is added a treatise on playing the Organ or Pianoforte by figures, etc. Published by Oliver Ditson, Boston; sold by Gould & Berry, 297 Broadway, and Mason & Law, Park Row, N. Y.

Horsemanship.—This is a work published by A. Hart, of Philadelphia, and is a translation from the ninth Paris Edition of Baucher's Method of Horsemanship. We have looked over the pages of this work, and believe it to be of great practical utility, and a work of evident necessity. In the city of New York we rarely see a horseman in the true sense of the term; Kossuth and the Hungarian officers along with him are the finest horsemen that we have seen here.

The American Whig Review—By D. W. Holly, 150 Nassau street, is an interesting literary journal, and an able exponent of the principles of the party to whose service it is in part devoted. Terms $5 per annum; monthly.

The Shadow Land, or, The Seer—By Mrs. E. Oakes Smith; Fowlers & Wells, publishers, mailable at 25 cents. The authoress of this work is no novice, but ranks among the most vigorous and interesting writers in our country. If we mistake not, the present work is another addition to her well known literary abilities.

TO MECHANICS,
Manufacturers, and Inventors.

SEVENTH VOLUME OF THE
SCIENTIFIC AMERICAN.

MESSRS. MUNN & CO.,

AMERICAN & FOREIGN PATENT AGENTS,

And Publishers of the SCIENTIFIC AMERICAN, respectfully announce to the public that the first number of VOLUME SEVEN of this widely circulated and valuable journal was issued on the 20th of September in AN ENTIRE NEW DRESS, printed upon paper of a heavier texture than that used in the preceding volumes.

It is published weekly in Form for Binding, and affords, at the end of the year, a SPLENDID VOLUME of over FOUR HUNDRED PAGES, with a copious Index, and from FIVE to SIX THOUSAND *ORIGINAL ENGRAVINGS*, together with a vast amount of practical information concerning the progress of INVENTION and DISCOVERY throughout the world. There is no subject of importance to the Mechanic, Inventor, Manufacturer, and general reader, which is not treated in the most able manner—the Editors, Contributors, and Correspondents being men of the highest attainments. It is, in fact, the leading SCIENTIFIC JOURNAL in the country.

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